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TEXTILE WORLD RECORD

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

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Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

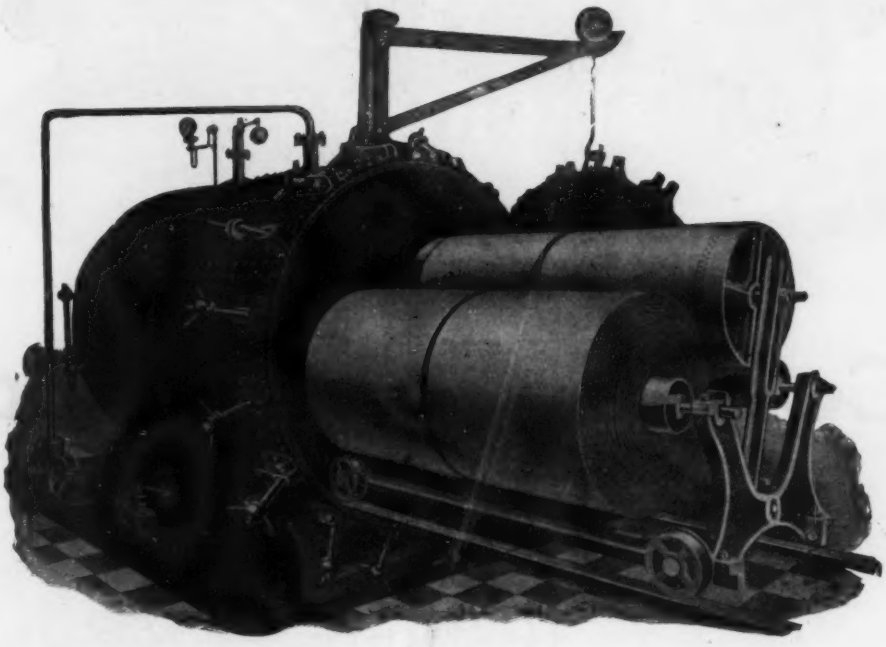
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



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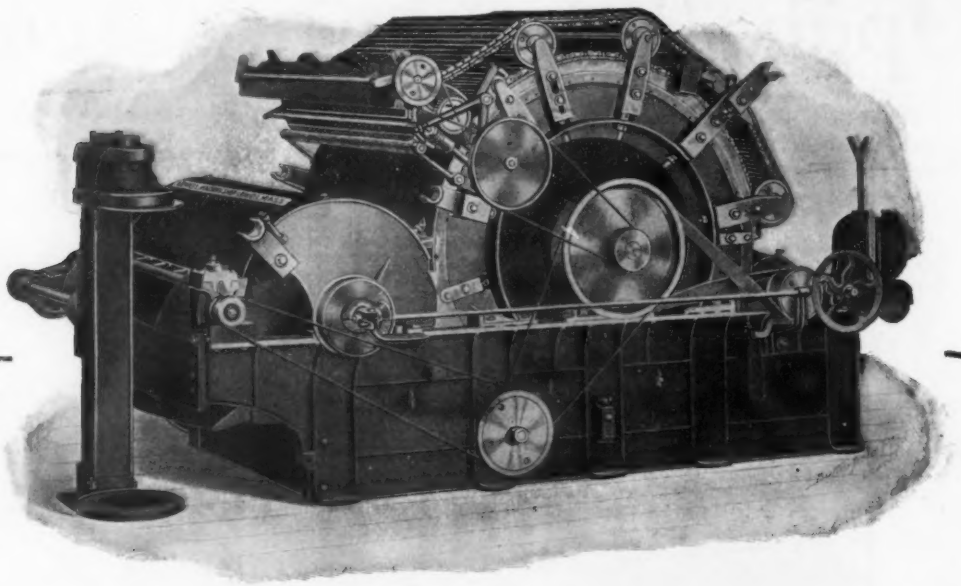

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With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

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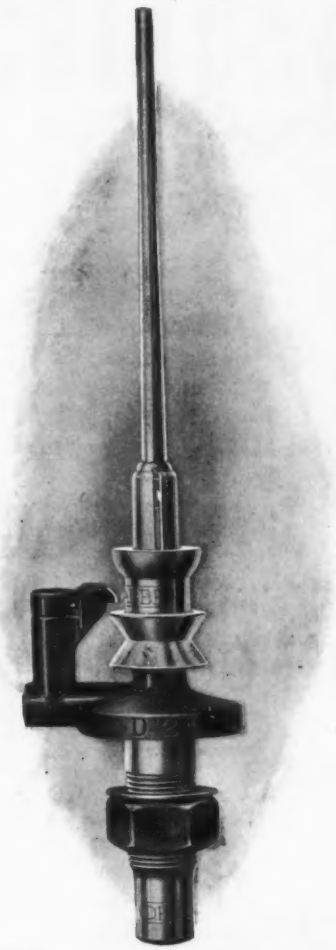

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Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

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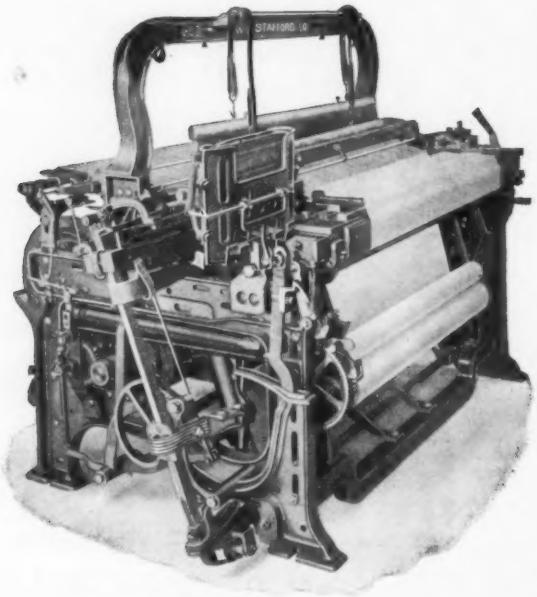

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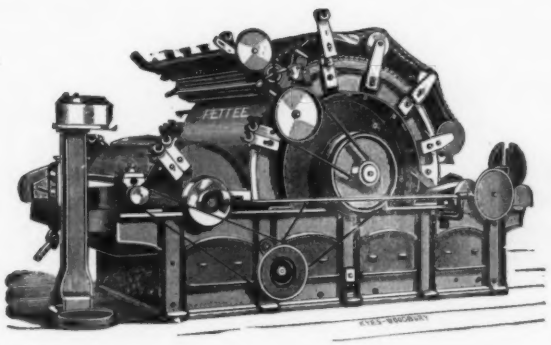

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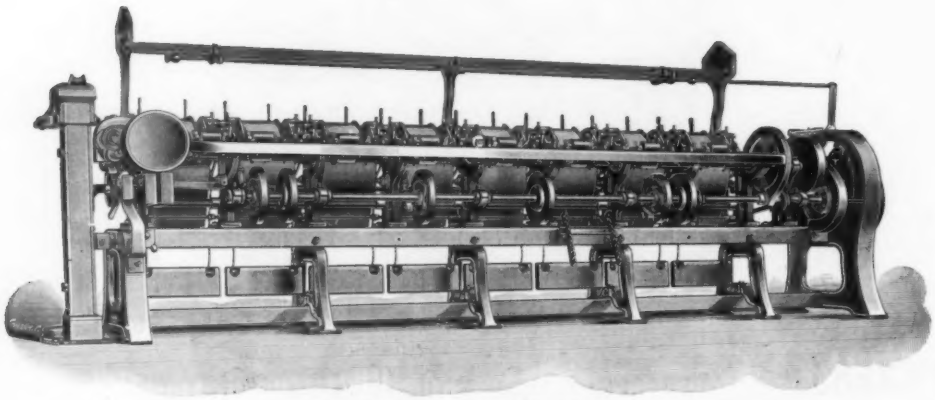

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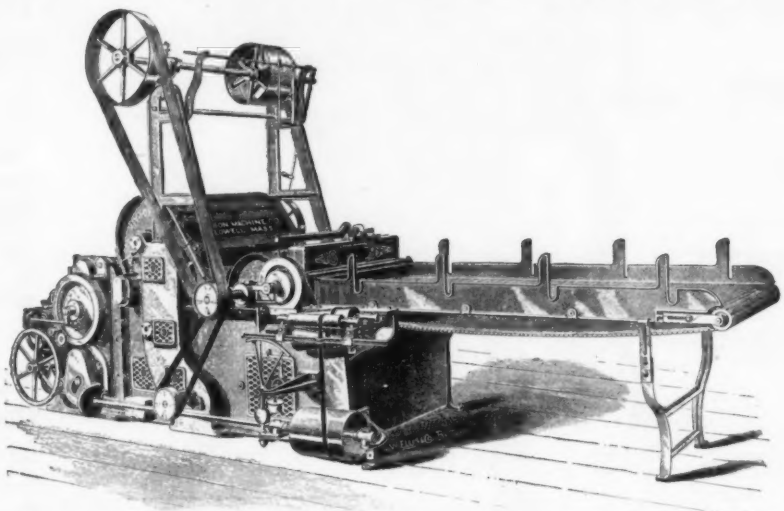

In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

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LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

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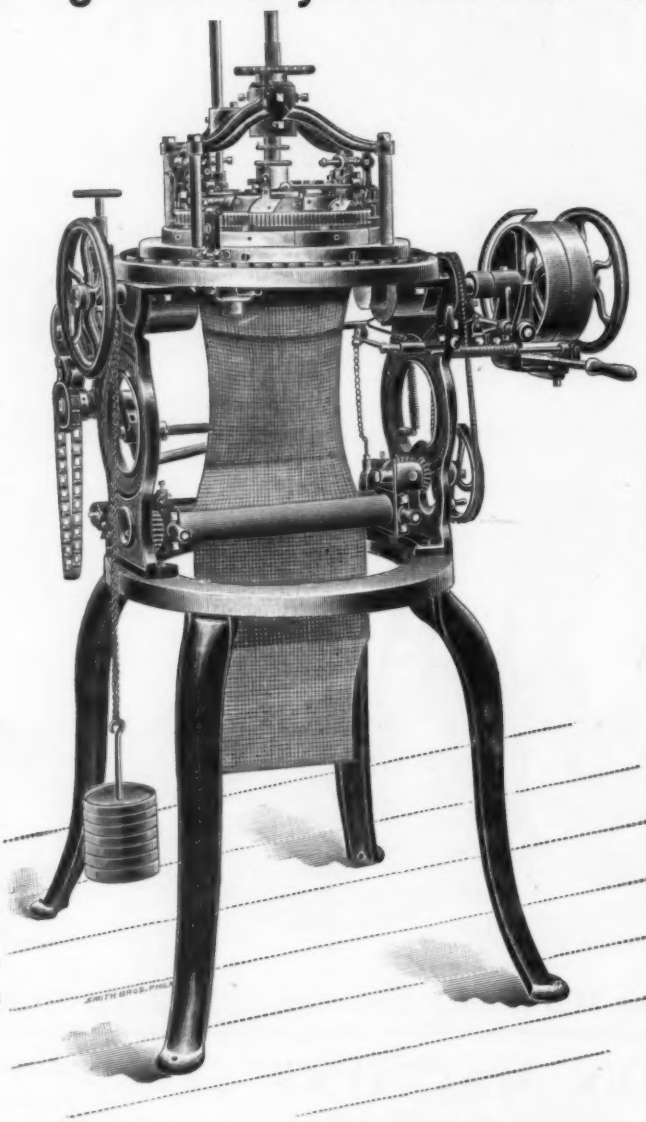
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

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A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

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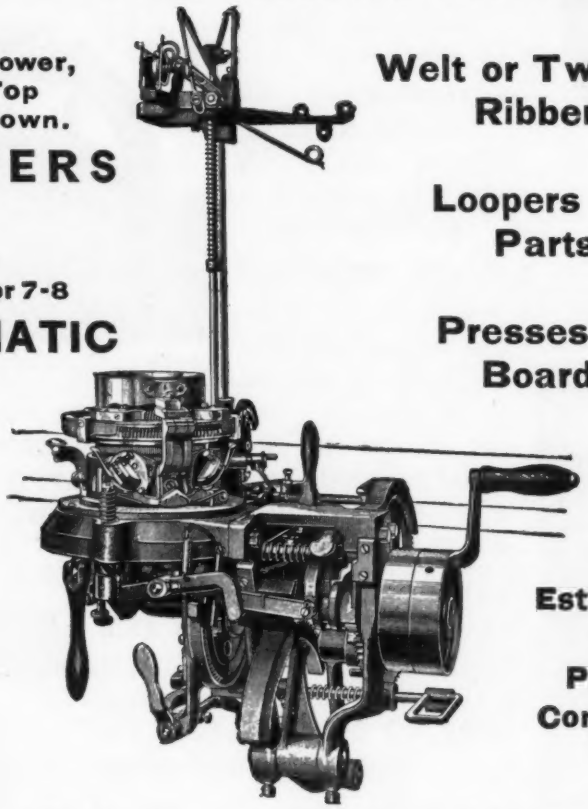
AUTOMATIC KNIT-TERS

All Sizes and All Gauges.



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Hand Forged Steel Cylinders.

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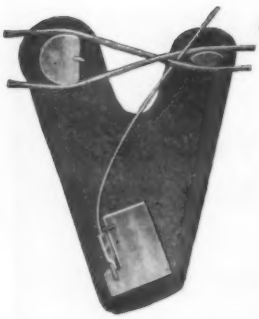
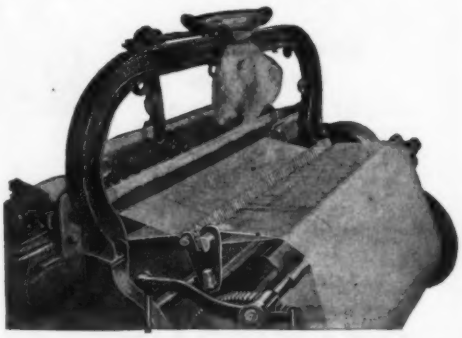
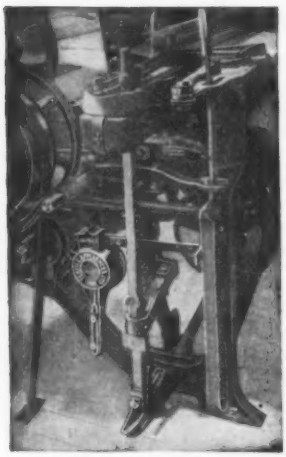


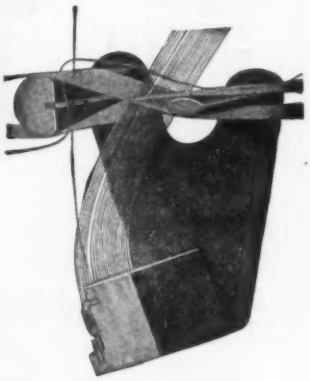
Our **WARP-STOP** controls **TWO threads by ONE spring WIRE, held in a COMB,** engaging the warp in such a way that **the TENSION is UNDER CONTROL,** and **ABRASION of the yarn is AVOIDED.**



The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving **a CLEAR SIGNAL of the place of the BROKEN END,** and, by striking **a CONTACT SLIP upon which LINT CANNOT COLLECT,** closes the circuit through **a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED,** and **actuated by a SPARKLESS current.**



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Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

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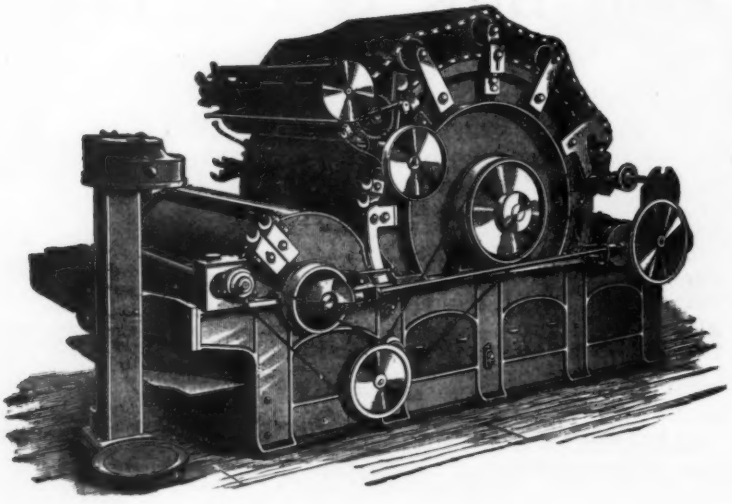

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Southern Office, Charlotte, S. C.

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Increases Production, Improves Quality, Decreases Labor Cost.

THE BRAMWELL SELF-WEIGHING FEEDER,

For Woolen, Worsted, Hosiery and Shoddy Cards and Garnett Machines.

We began introducing this feeder more than twenty years ago and its use is now practically universal. Many other types and makes have been tried and discarded, but the Bramwell, in its improved and up to date form, is now recognized everywhere as the most perfect feeder and only complete feeding machine in the world.

Our long experience has proved conclusively that where evenness is required—determined by weighing—our weighing feature is absolutely indispensable. Several attempts have been made to introduce feeding machines ignoring this principle, but none have succeeded.

We have made a careful study of all phases of the feeding problem and by adaptations and modifications of the Bramwell Feeder to meet the particular conditions, are prepared to feed evenly all kinds of stock from rabbit's fur to jute tow, including shoddy, cotton, fine wool, mixtures, fine and coarse worsted, flax tow, long worsted and all other kinds of stock.

THE APPERLY FEEDER,

For Second Breaker and Finisher Cards.

This machine was originally brought to this country and introduced against great opposition by the founder of this concern, the late Geo. S. Harwood. Today there are about 15,000 machines of our construction running in this country and Canada. We have greatly improved the machine. It is today an efficient, positive and up-to-date feed, and we can offer manufacturers the choice between the Kemp positive geared traveler and the Standard traveler with all other recent improvements.

THE BRAMWELL PICKER FEED,

For Burr Pickers, Mixing Pickers, Fearnaughts and Lumpers.

We consider our improvements in picker rooms of the utmost importance for up-to-date manufacturers. In fact, wide awake manufacturers are more and more realizing the wisdom of bringing their stock to the card room in a better state of preparation. Hand feeding is becoming a thing of the past in the picker room as in the card room. The latest Bramwell Picker Feed is built to handle all kinds of stock in any quantity with evenness and without injury to the staple. The extensive introduction of our feed in first-class picker rooms has led to the successful introduction of

THE SPENCER AUTOMATIC STOCK OILING MACHINE.

This is a modern device for oiling the stock automatically on its way to the picker from the Bramwell Picker Feed, superseding the wasteful, dirty method heretofore in use. Because of the accuracy of this method and the fact that the oil goes on the stock only (instead of the floor and walls) there is a large saving of oil, and the stock is at the same time more evenly oiled and much better prepared for the carding process.

THE MODERN BRAMWELL FEED FOR WOOL WASHERS AND WOOL DRYERS.

The scouring and drying of stock is today recognized as a very important part of the manufacture of textiles, especially in worsted mills. Our feeds are recognized as the standard for properly feeding stock in the grease or wet stock with absolutely no injury to the staple, with evenness and in sufficient quantity and in the best possible condition for economical scouring. There have been other feeds offered for this class of work, but after clogging up and giving all kinds of trouble most of them are today in the scrap heap, having been replaced with our feeders.

REPAIRS AND IMPROVEMENTS FOR OLD FEEDERS.

We have not been standing still all these years and the feeders we are building today are modern and up-to-date but these improvements and attachments can be placed on older feeders of our construction, greatly to their benefit. We do not hesitate to claim that **no outlay will show a greater return** to a manufacturer than money spent in bringing your Bramwell and Apperly Feeds thoroughly up-to-date.

APRONS OF ALL KINDS.

We build about thirty different styles of spike aprons adapted to the various kinds of stock our feeders are called upon to handle. Our policy is and will be to put into our aprons the **best** materials and workmanship money can buy. We know we could make cheaper aprons by using cheaper materials and less expensive labor and it would take manufacturers some years to find us out. The apron would LOOK nearly as well but would WEAR only two or three years instead of from five to ten or twelve. Do not trust the man who says he can sell you aprons cheaper than we can. He can do it (and so could we) but you pay the bill in the end. The best is none too good and is the cheapest in the long run.

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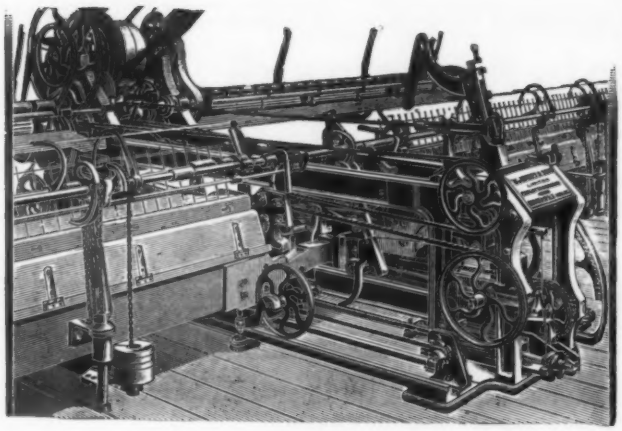

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Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

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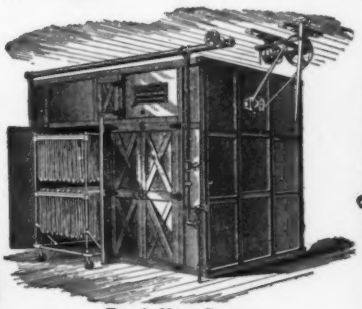
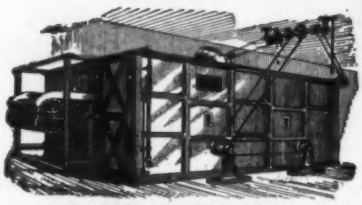


Truck Yarn Dryer.



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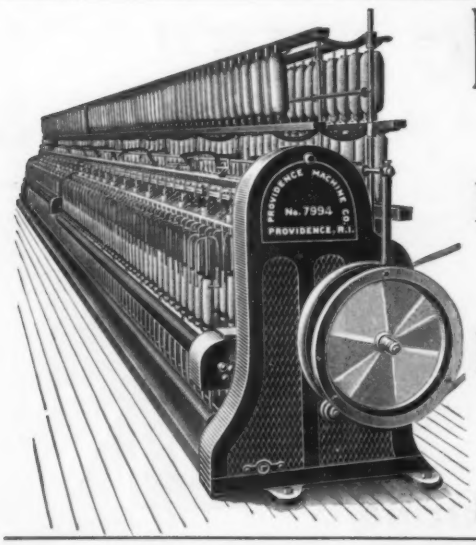

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Manufacturers of

Improved Cotton Roving Frames

Improved Worsted Roving Frames

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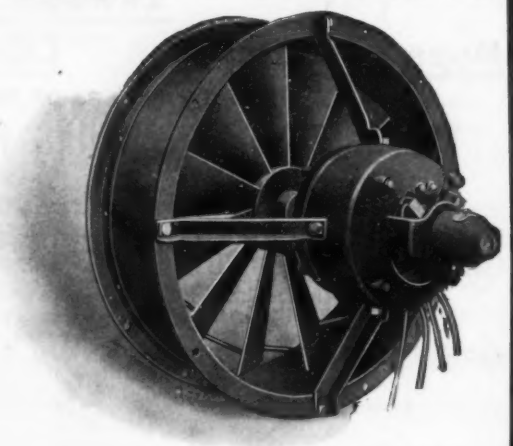
Wound for any voltage.



WATSON TEXTILE MOTOR DRIVING VENTILATING FAN.

WATSON TEXTILE MOTORS

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Spinning Frames

Under the Breese Patents

For Wool Spinning

and other Fibrous Materials.

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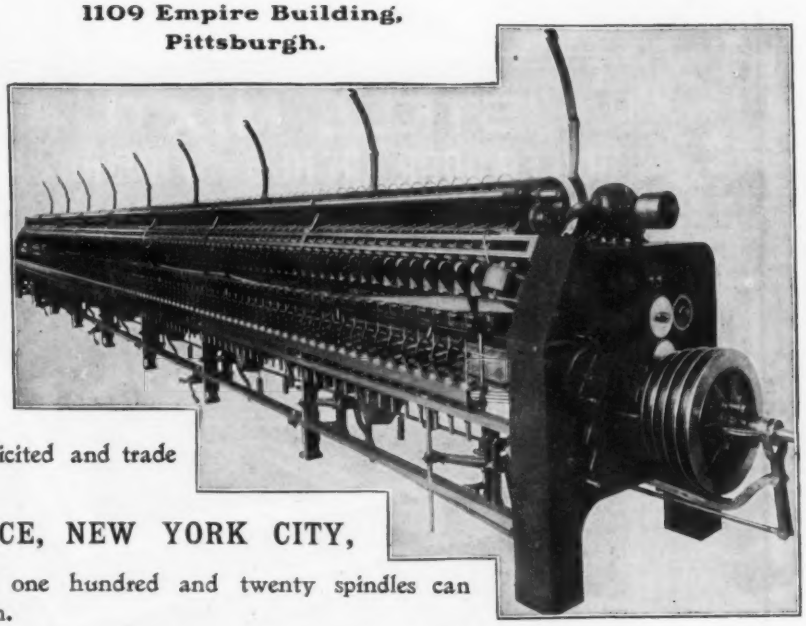

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Where a frame of one hundred and twenty spindles can be seen in operation.

Barney Compound Ventilating Fans

Bring Coolness and Health

into Buildings and Remove Impure Air, Dust, Smoke, Gases, etc.—*AND THE COST ISN'T TOO MUCH!*

We are experts in Ventilation, Heating, Cooling and Drying. Our long practical experience and Barney Fans form a combination that produces the right results.
Ask us for more facts and names of firms, corporations, municipalities and individuals for whom we have executed difficult orders.

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BOILER DOOR ARCHES AND FIRE BOX BLOCKS
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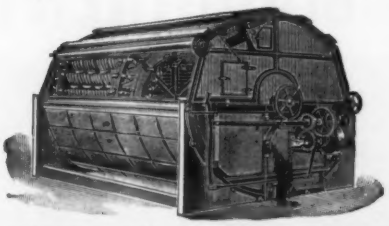
Steam and Hot Water Heating Apparatus.
Steam Specialties, Pipe Fitters' Tools, Etc.
PIPE CUTTING A SPECIALTY.

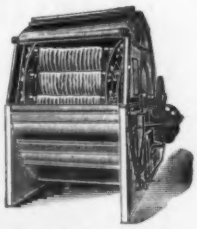
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

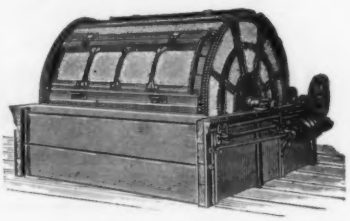
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

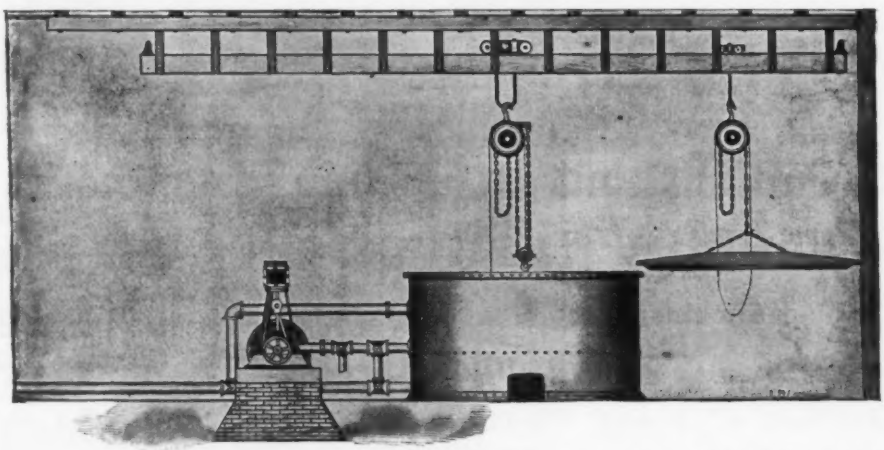
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

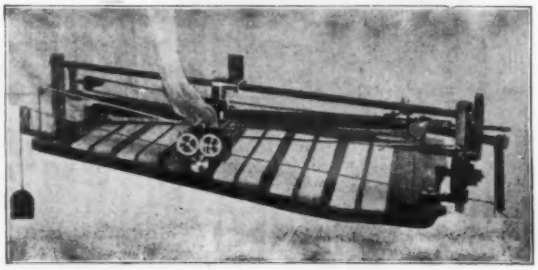
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

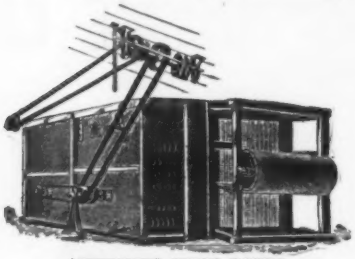
Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

Dryers for Wool and Cotton Stock, Yarn, Stockings and Underwear. Carbonizers, Ventilating Fans, Yarn and Wool Scouring Machines, Cloth Washing and Dyeing Machines, Tom Toms, Chroming Oxidizing Machines.



WEB FEED.



AUTOMATIC STOCK DRYER.

We also manufacture Kershaw's Geared Traveler and Improved Web Feed.

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19th AND WESTMORLAND STS., PHILADELPHIA, PA.

ALEXANDER & GARSED, Charlotte, N. C., Southern Representatives.

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ARTHUR S. BEVES, Sec. and Treas.

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Factory,
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Rubber Machinery, Including Calenders, Washers, Mixers, etc.

Hydraulic Machinery

Builders of Heavy Machinery. High Grade and Large Castings a Specialty.

INQUIRIES SOLICITED

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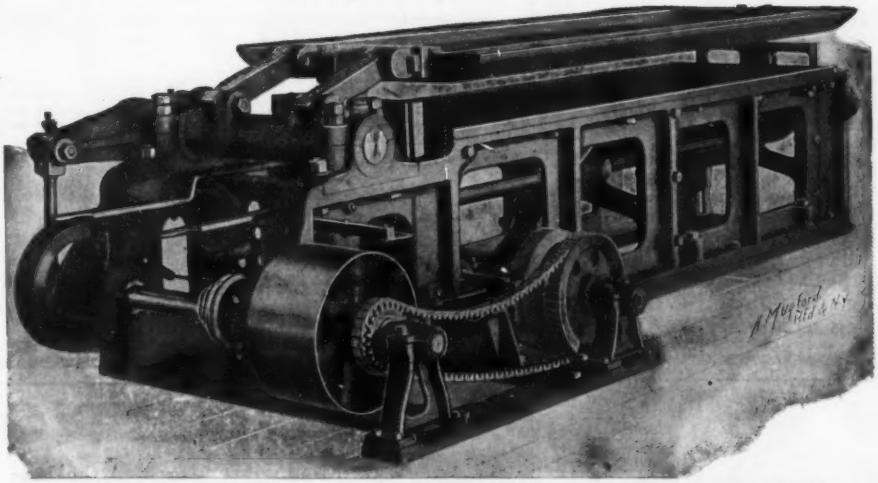

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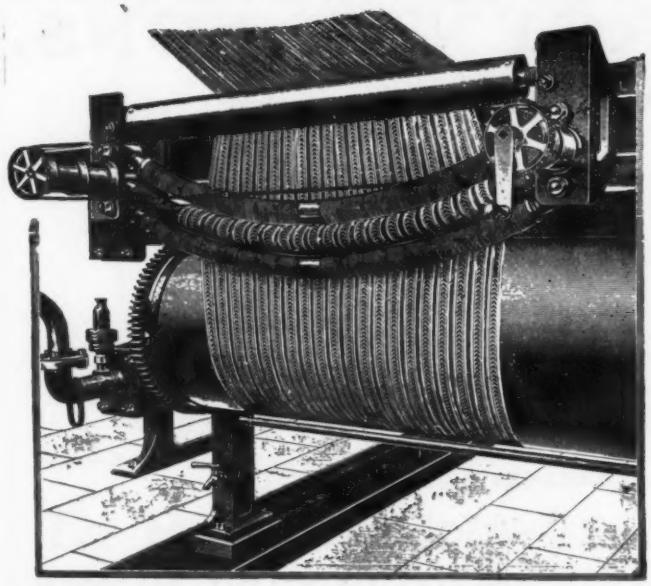
Chilled and Soft Iron Rolls, Machine Moulded and Machine Cut Gearing, to 20 ft. diameter. Heavy Transmission Machinery, Etc., Etc.
Heavy Castings, in Gray Iron or Semi Steel.

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

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Sole Agents for the United States and Canada.

P. & C. GARNETT, Ltd.

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Wharfe Works, Cleckheaton (Yorks), England

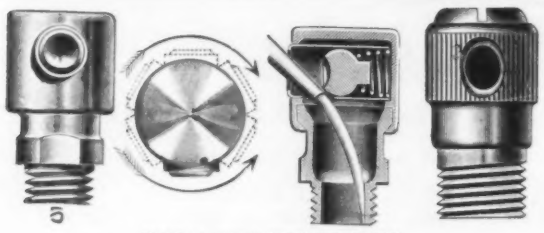
ORIGINAL PATENTEES AND MAKERS OF

The "Garnett" Machine or Waste Opener

Also The GARNETT Patent Knot-Breaker or Preparer.

For preparing waste for the Garnett Waste Openers, breaking knots and other hard substances, old ropes, bagging, etc. No waste puller should be without this most valuable machine which saves the fine clothing of the Garnett Machine.

Original makers of Garnett or saw-tooth wire, in best Swedish Iron, and Cast Steel, with points hardened by electricity. .... Burr Rollers, Breasts for Woolen Cards, Lickerin Rollers, Rag Machines.



PROTECTION

From dust and grit to the bearings of a machine, and proper lubrication is assured when fitted with

TUCKER DUST PROOF OIL CUPS

POSTAL WILL BRING SAMPLE.

W. & C. F. TUCKER, HARTFORD, CONN.

C. G. SARGENT'S SONS,

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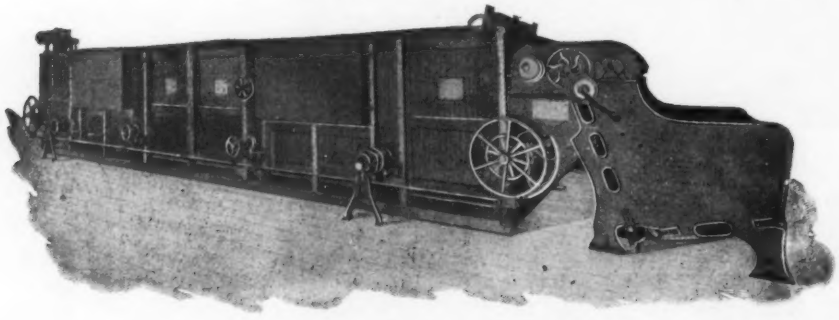
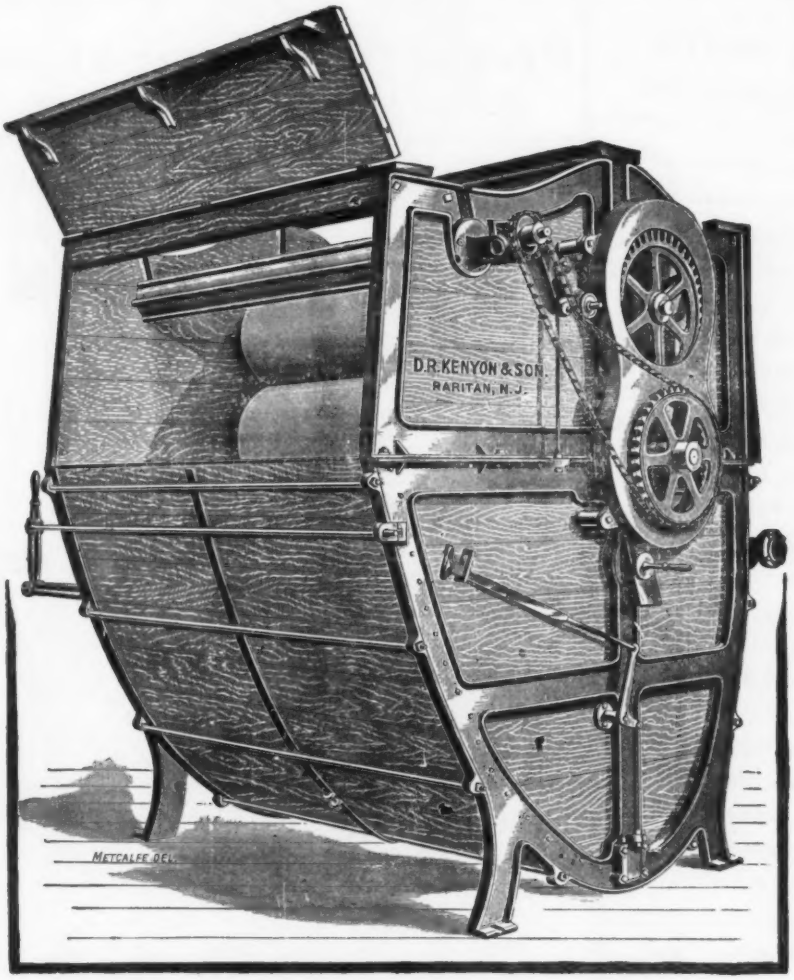


... BUILDERS OF ...

Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
Burr Pickers, Etc.

Kenyon's Improved Cloth Washer

FOR FOUR, SIX OR EIGHT STRINGS OF GOODS



BEST QUALITY SOLID ROLLS.

Improved trough and valves, preventing wash of liquor and insuring quick and thorough scouring and rinsing.

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BUILDERS OF WOOLEN MACHINERY

RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
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Soaping Machines.
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For Extracting Water From Cloth.

Type A.

Extracts thoroughly and uniformly. Requires fully 70 per cent. less power than Centrifugal Extractors.

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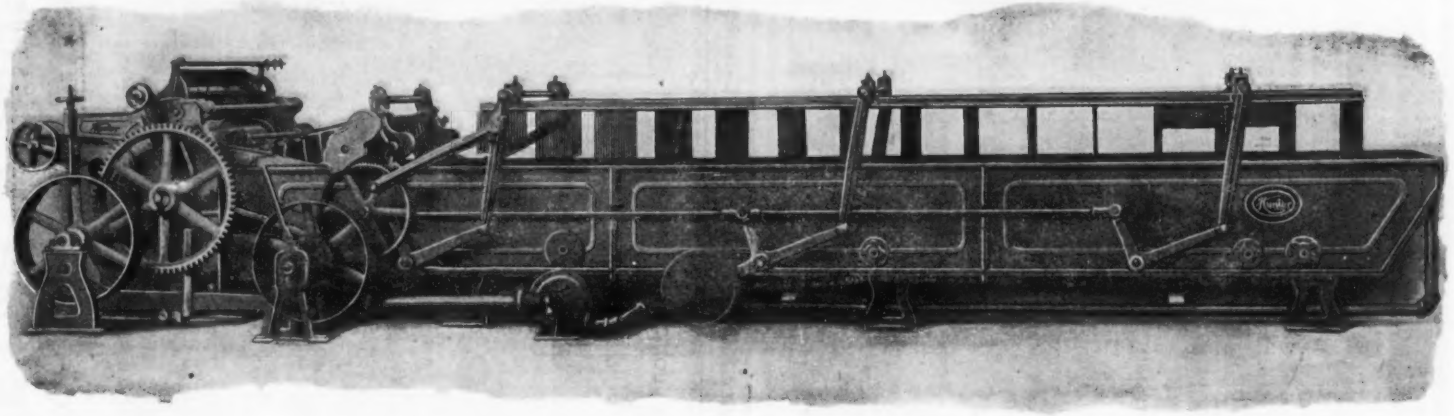
Main Office and Works,
ORANGE, MASS.

Automatic **The Hunter** *Parallel Rake*

WOOL WASHERS



The Most Perfect Wool Washer Made.

Built By

The JAMES HUNTER MACHINE COMPANY, North Adams, Mass., U. S. A.

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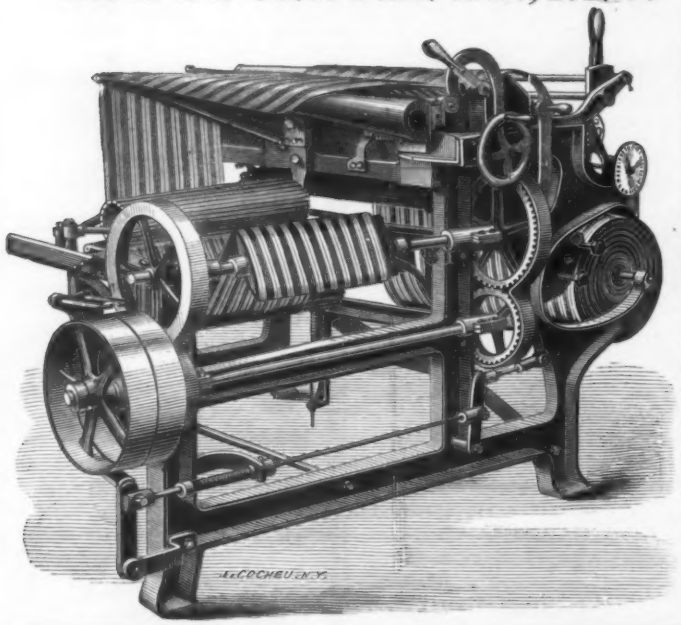

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On Cottons, Woolens and Carpets.

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and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

Patented in the United States and Foreign Countries.

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WROUGHT STEEL

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Is a parting PULLEY and can be applied without stripping the shaft.
It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly — keys and set-screws superfluous.
Interchangeable metal Bushings to fit shafts of different sizes.
Particularly adapted to TEXTILE manufacturing.

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THE "GREEN-MATTEAWAN"

STEEL PLATE FAN

System of forced or induced draft is what you need to remove dust and waste, to heat or ventilate, remove stringy material, etc.

Its economical.

Its many special features commend it strongly to the careful investor.

We've been studying the mechanical draft problem for years.

We've met every kind of problem—solved it.

Kept a record of it too.

Now we want to show you what kind of an apparatus this experience has enabled us to build.

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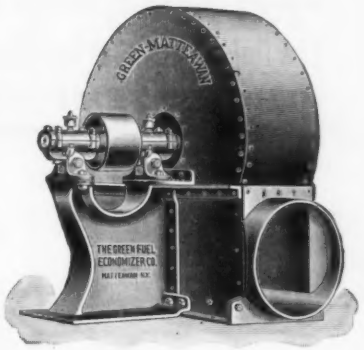

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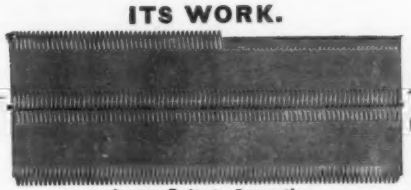
ITS WORK.

A 5" Belt — less than 3 minutes.



The Cost — One Cent.

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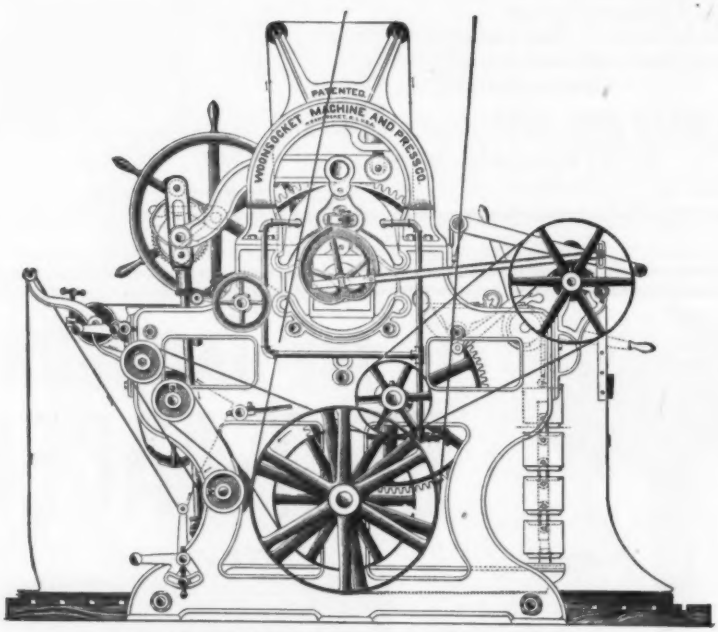
Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

Woonsocket Machine and Press Company

WOONSOCKET, R. I,

DINSMORE

Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

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Successors to Silver & Gay Co., Est. 1832.
Successors to No. Chelmsford Supply Co., 1897.

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Ball Winders, Quillers, Jack Spoolers, Wool Openers, Reels and Special Machines from Drawings or Patterns.

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TEXTILE MACHINERY,

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NEVER SLIP COP SPINDLE

PREVENTS BROKEN COPS, SMASHES, WASTE, IMPERFECT GOODS AND ALL THE SHUTTLE TROUBLES WITH COP FILLING . . .

The illustrations explain this simple device:—
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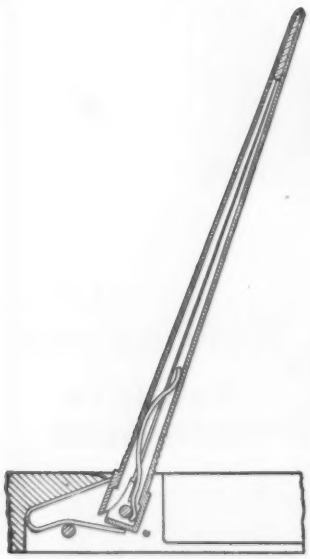
When the spindle is lowered into the shuttle the two parts forming the base are expanded holding the cop firmly in place. The pressure is sufficient to hold the cop on a smooth spindle but the corrugations at the base of the spindle hold the cop still more securely.
The spindle contracts when again raised and the empty cop is easily removed.



SHUTTLE SPINDLE OPEN.

SHUTTLE SPINDLE CLOSED.

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AMERICAN MOISTENING COMPANY

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Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

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Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

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How to Save Comber Waste and Increase Production.

Here in New Bedford, cotton combing has been brought to a high state of perfection and we have the opportunity of studying comber questions and noting how the best results are obtained.
A marked increase in speed with more production, and yet with less waste, can be obtained by refluting the detaching rolls and putting on new top rolls of **solid** brass with **cast-steel hardened** ends or bearings.
The best mills are doing this. Try it at our expense. Send us a detaching roll. We will **reflute** it and make the new top rolls on trial.
If you are not satisfied, it will cost you nothing for our work. **But you will be.**

BAKER MACHINE CORPORATION, New Bedford, Mass.

We also do repair work on Flyers, New Pressers, etc.

N. B.—We have thousands of Bodden Flyers in stock. Sizes 6", 7", 8", 9" and 10". Prices way down.

Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

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HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

James Hill Manufacturing Co.,

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EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

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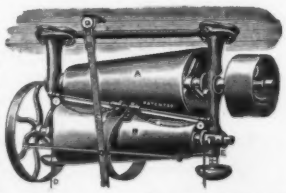

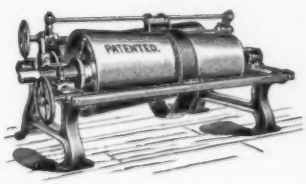

Smith & Winchester Co., So. Windham, Conn., 250 sets. Ferguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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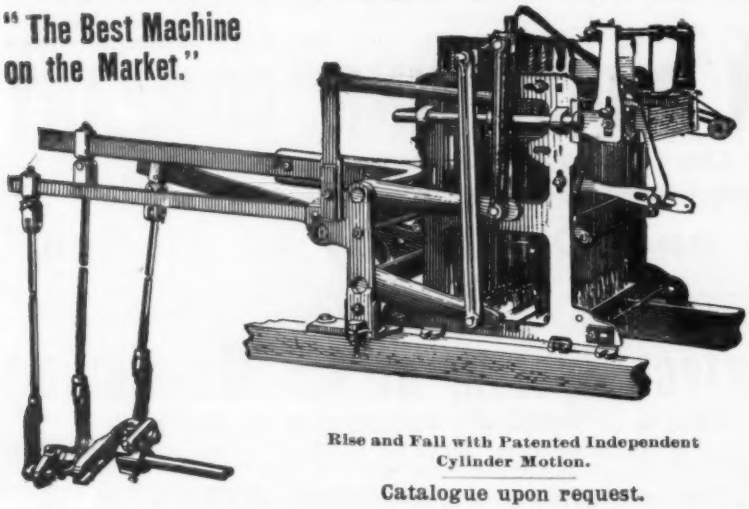

Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

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HALTON JACQUARD

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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Allegheny Avenue and C Street,

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Representatives
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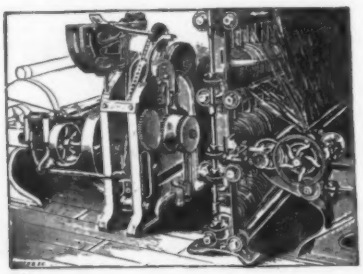
Alexander & Garsed, Charlotte, N. C.



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HARRISON, N. J.

TORRANCE PATENT AUTOMATIC BALLING MACHINE

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

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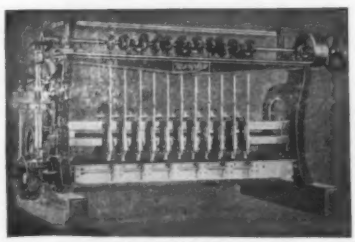
C. E. ROBERTS, Manager. W. H. ALLEN, Ass't Manager.

STEAM USERS of this country have upwards of 90,000 Steam Boilers under the inspection and insurance supervision of this company.



50-IN. MACHINE

L. F. FALES

MANUFACTURER AND BUILDER OF

SEWING Wanniplex MACHINES

FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

DESIGNER OF SPECIAL MACHINERY | WALPOLE, MASS. U. S. A. | PAPER SLITTING MACHINES

The Metallic Drawing Roll Co.

INDIAN ORCHARD, MASS.

MANUFACTURERS OF

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Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

WRITE FOR PARTICULARS.

T. C. Entwistle Company

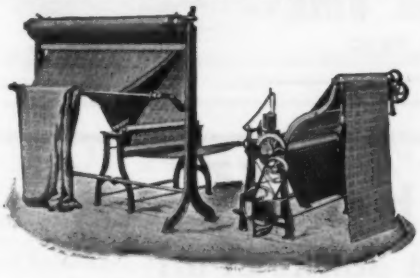
LOWELL, MASS.

Warpers,
Ballers,
Beamers,

And PATENT EXPANSION COMBS For Warpers, Beamers and Slashers.

STUART W. CRAMER, Southern Agent, Charlotte, N. C., and Atlanta, Ga.

WOOL BURRING and PICKING MACHINERY
CLOTH FINISHING MACHINERY

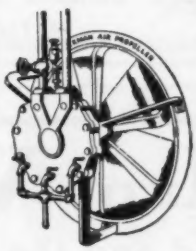


DOUBLING AND TACKING MACHINE

Curtis & Marble Mch. Co.
WORCESTER, MASS.

Blackman Fans

With Direct Connected Engines.



ECONOMICAL FIRST COST OPERATION

Can be run at any speed and any time. No long shafting and belts to waste power.

For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

E. M. NICHOLS,
639 Arch St., - PHILADELPHIA, PA.
Write for particulars.

CIRCLES, HACKELS, GILLS, FALLERS and PORCUPINES.
CIRCLE KNIVES TO ANY PATTERN.

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Dealer in

The Best English and American

CAST-STEEL PINS.

1842-44-46 GERMANTOWN AVENUE,
Long Distance Telephone. Philadelphia, Penn.

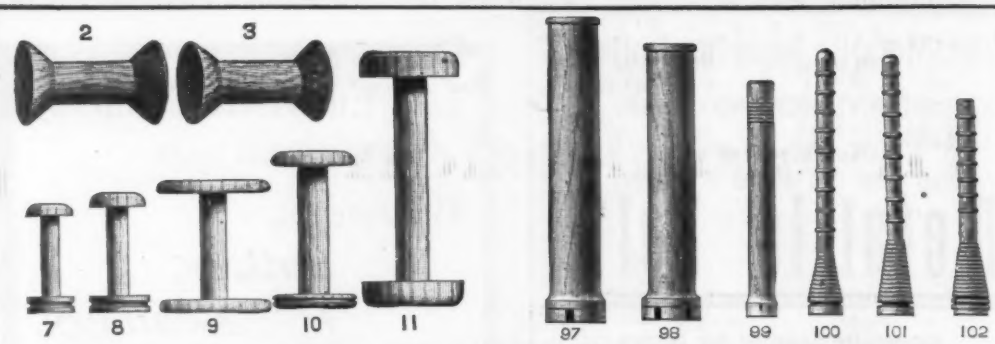
JOHN M. DEAN,

MANUFACTURER OF

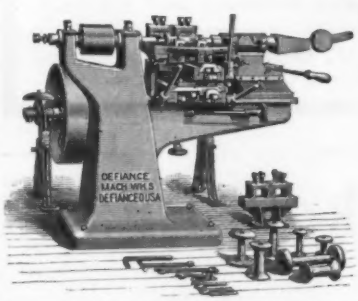
Hackle, Gill, Card and Comb Pins. Comber Needles all sizes.

Carrying Combs, Porcupines, Tenter Plates, Gills, Fallers and Flat Pins of Every Description. Circle and Faller Repairing and Repinning. Weavers Pick Out Comb Pins.

Tanner Street, Corner St. Hyacinth, Lowell, Mass.



SPOOL AND BOBBIN MACHINERY



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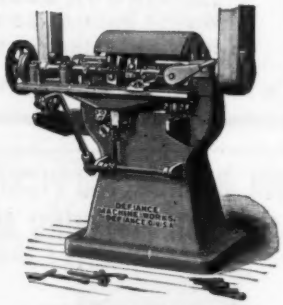
Complete Equipment
OF THE
MOST MODERN TOOLS
25% SAVED
Over the Old Methods
Send for Catalogue and Particulars to
THE
Defiance Machine Works,
DEFIANCE, OHIO



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The Man Who Knows

the good and the bad points of all

Typewriters

buys the

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REMINGTON TYPEWRITER CO.

New York and Everywhere

The Bell System of Humidification

Produces and automatically maintains throughout the year the uniformity of conditions that every textile manufacturer desires and now finds it so hard to realize. These conditions he can never get by squirting steam or water into his rooms and trusting to luck.

The whole trend of modern manufacturing is toward trusting more in the machine and less in the man. For this reason all auxiliary apparatus should be as nearly automatic as is possible.

The Bell Humidifier delivers air carrying moisture as aqueous vapor, just as it is found in nature, which moistens thoroughly and uniformly. Being SELF-REGULATING, it does not keep on moistening when further moistening is useless or harmful.

VENTILATION & HUMIDIFICATION
BELL PURE AIR AND COOLING CO.
TRADE MARK

BELL PURE AIR & COOLING CO.

97 CEDAR STREET, ... NEW YORK, N. Y.

COTTON MILLS

and all kinds of textile industries would be a great success at a number of cities and towns in the excellent cotton growing sections of the South and Southwest, tributary to the

FRISCO SYSTEM

First-class inducements, such as free sites, bonuses, subscriptions to stock, etc., will be given by a number of cities and towns to secure this class of industry. It is a well-known fact that cotton grown in Indian Territorry and Oklahoma is equal to the very best, owing to its long staple and superior quality. Natural gas in abundance is also available in a number of sections and could be utilized in running cotton and knitting mill machinery.

Send for copy of "Opportunities" giving full information relative to openings of all kinds of industries, factories, etc.

M. SCHULTER,
Industrial Commissioner
FRISCO BUILDING, ST. LOUIS.

You Save Enough Insurance to Pay for the Equipment.

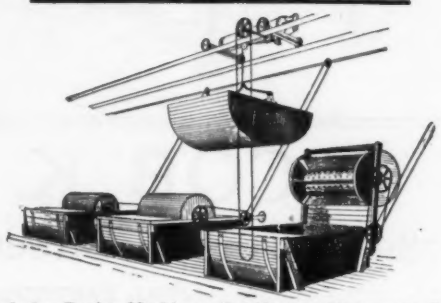
So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

Smith, Drum & Co.

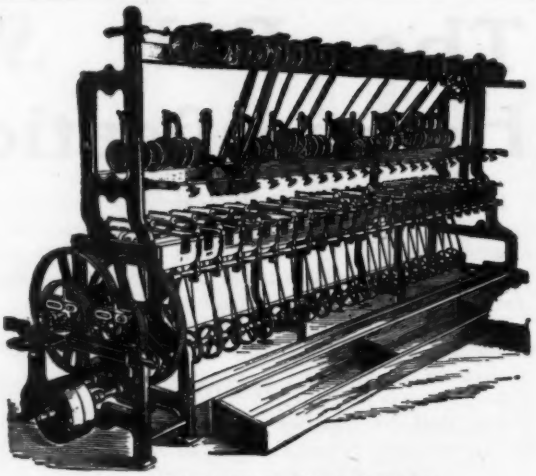
2503-9 CORAL ST., PHILA., PA.

Dyeing Machinery
FOR WARPS AND PIECE GOODS
Bleaching Machines

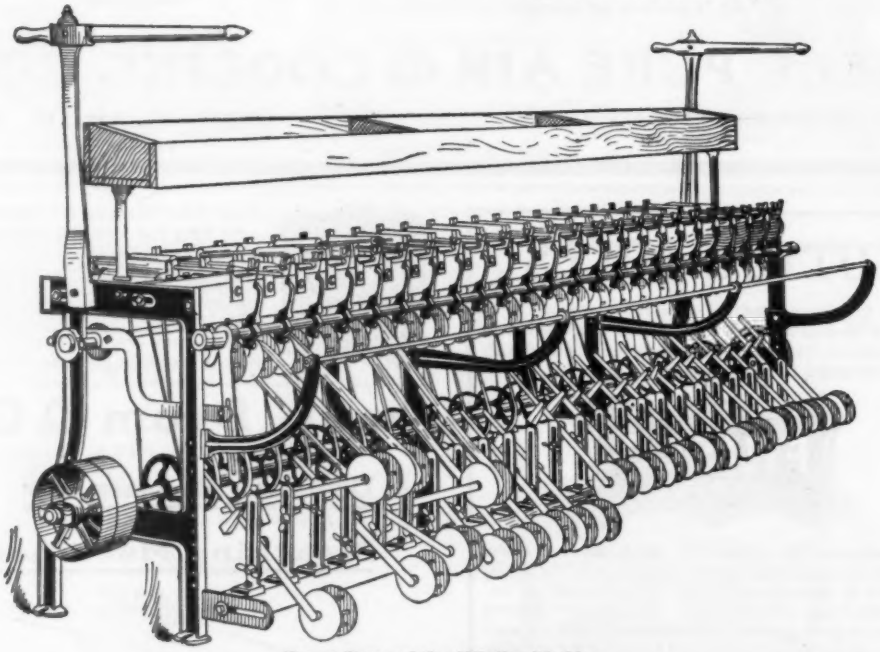


Circulating Dyeing Machines. For Hosiery, Underwear, Raw Stock and Rags. Singeing Machines for Hosiery. Mercerizing Machines.

SPOOLING, WINDING, WARPING AND BEAMING MACHINERY



Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



Patent Butt and Cop Winding Machine.

JACOB K. ALTEMUS,

2818 North 4th Street, PHILADELPHIA, PA.

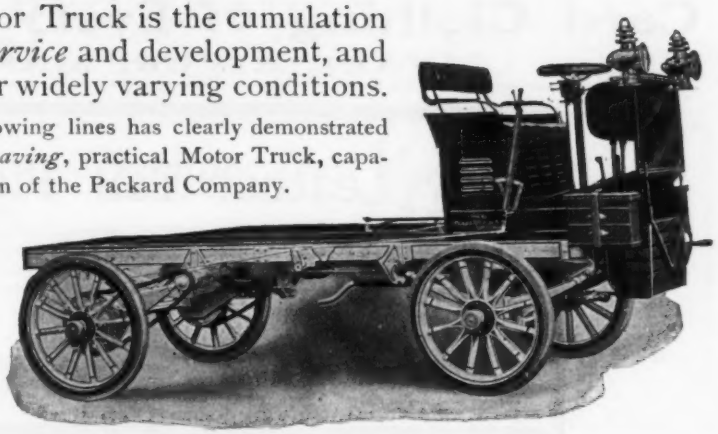
FULL PARTICULARS ON APPLICATION.

Packard

The Packard Motor Truck is the cumulation of two years' *actual service* and development, and exhaustive tests under widely varying conditions.

Actual work in the following lines has clearly demonstrated that the Packard is a *money saving*, practical Motor Truck, capable of sustaining the reputation of the Packard Company.

Bakers (Wholesale)
Brewers
Express
Electric Lighting
Foundry
Grocers (Wholesale)
Mineral Water
Milling
Oils (Wholesale)
Paint Manufacturers
Hardware (Retail)
Soap Manufacturers
Stove Manufacturers
Telephone Company
Transfer Company
Varnish Makers



The Packard Motor Truck is not a pleasure vehicle "warmed over" for business purposes, but is designed from the ground up solely for *Trucking Service.*

It is built side by side with and by the same men and tools that produce the Packard Touring Car.

The following is a recent demonstration test. Full report sheets will be furnished of this and many others on application.

JUNE 1, 1905—TEST BY STANDARD OIL COMPANY.

Kind of Load—Oil in barrels.
Weight of load—4,300 pounds.
Total time—5 hrs. 49 min.
Time stopped—2 hrs. 38 min.
Net running time—3 hrs. 11.
Total number of miles—39⅝.
Total number of stops—28.
Average miles per hour—12 4/11.
Gasoline used—4 gallons.
Lubricating Oil used—½ pint.
Cost for supplies—42 cents.
Miles per gal. gasoline—10.

Test consisted of delivering oil in barrels to various customers, with running distance of from ⅛ to 3½ miles between stops. 4300 lbs. transported 39⅝ miles in 3 hrs. 11 min. at a cost of 42 cents.

Normal load capacity, 1¼ tons.

Speed range, 1 to 15 miles per hour.

Price of chassis, complete, ready for body, $2,500 f. o. b. factory.

Body designs and quotations submitted upon application.

PACKARD MOTOR CAR CO.

Desk S. **Detroit, Mich.**

New York Branch 1540 Broadway. Member A. L. A. M.

ANYTHING in Mill Supplies.

Entire Outfits for New Mills, or small and odd items that that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.,
PROVIDENCE, R. I.

ASHWORTH BROS.,

—MANUFACTURERS OF—

Card Clothing of Every Description

FALL RIVER, MASS.

Leather Tail Pickers

TRADE MARK

We can furnish more than one hundred different patterns of leather tail pickers for cotton looms and make to order any special pattern desired. These pickers are made in a variety of grades which sell at different prices according to the quality of the leather of which they are made. Samples and prices on application

Garland Mfg. Co. *Formerly Loom Picker Co.* Saco, Maine

E. L. TEBBETS & CO.,
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Thread and Silk **SPOOLS** of any description made from one piece, up to 6" long and ⅜ dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

WARD & VANDEGRIFT,

Successors to The Bridesburg Mfg. Co.

In the Manufacturing of **SPINDLES,**

For Cotton, Woolen, Worsted, Silk and Flax Machinery. Manufacturers and Repairers. Also Flyers, Steel Caps, Bolsters, Steps, Tubes, Etc.

ELMER, SALEM CO., .. N. J.

TEXTILE MACHINE WORKS

THUN & JANSSEN, READING, PA.

Manfrs of *BRAIDING MACHINES*

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers. Measuring Machines, Reelers, Singeing and Finishing Machinery. Special Machinery.

J. K. SHRYOCK,

PERFECT RIGID CLOTH BOARD TRADE MARK

19 South 7th St.,
PHILA., PA.

MANUFACTURER OF

Paper Cloth Boards

For Textile Mills

All weights and sizes furnished by thousand, ton or carload. Prompt delivery assured. Samples and prices on request.

The J. L. N. Smythe Co.

Leather Fibre S Manilla

23-25 So. 4th St., Phila.

Paper Specialties,

Fibres, Colored Textile Wrappers,

Manillas, and Tissues, Silk Papers, Corrugated Cloth Boards.

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DYEING
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ARLINGTON MACHINE WORKS
ARTHUR BIRCH
ARLINGTON HEIGHTS, MASS.

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MACHINES

THE U. S. MILL SUPPLY CO.
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Everything in Mill Supplies
"What you don't see, ask for"

Leather Belting	Heddles	Yarn Scales	Belt Hooks
Press'd Steel Pulleys	Heddle Frames	Roving Reels	Packings
Picker Sticks	Harnesses	Mill Crayons	Scales
Loom Pickers	Twine	Bobbins	Trucks
Loom Strapping (canvas & leather)	Spindle and Drum Banding	Spools	Brooms
Mill Baskets	Wire Goods	Shuttles	Brushes
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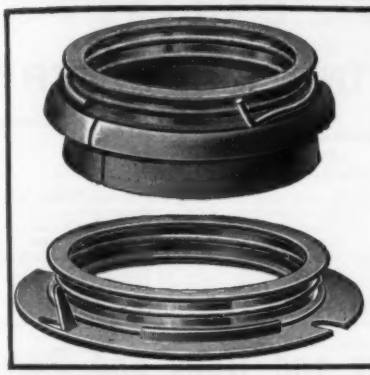

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SPINNING RINGS.
TWISTER RINGS.
RING HOLDERS.
TRAVELER CUPS.
SILK RINGS.
TRAVELER CLEANERS.

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WHITINSVILLE, MASS., U. S. A.

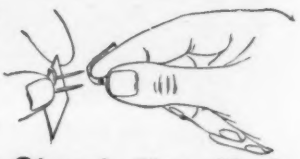
STEEL AND BRASS
MAILS.
Liberal Discount to Dealers.

J. WALDER, Paterson, N. J.
REEDS, HARNESSES, LINGOES, SHUTTLES AND QUILLS.

Have you seen the NEW PROTECTOR for PIN TICKETS?

Its the Niagara "Pin Kap"

The most simple little device for protecting all makes of Pin Tickets. Protects your fingers. Protects the samples. Ask us about them.



NIAGARA CLIP CO., - 38 Park Street, New York.

SAVE
Their Cost
In Freight.

THE CHAFFEE PATENT CLOTH BOARD,
Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.
BOX SHOOKS and CLOTH BOARDS.

MFG. BY
CHAFFEE BROTHERS COMPANY,
OXFORD, MASS.

Clean
LIGHT
Strong

Shaw's "Victor" Travelers
Manufactured by
VICTOR SHAW RING TRAVELER CO.
Incorporated 1899.
23 Sabin Street, PROVIDENCE, R. I.

Established 1870

John Heathcote & Son

Providence, R. I.

Builders of Improved

Cloth Tentering and Drying Machinery

for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

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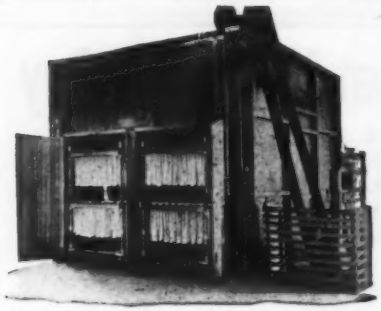


FRANK BAILEY,

BUILDER OF

YARN DRYING MACHINERY

ON THE

COLD AIR SYSTEM. Simple, effective, inexpensive. Leaves yarn in beautiful condition.

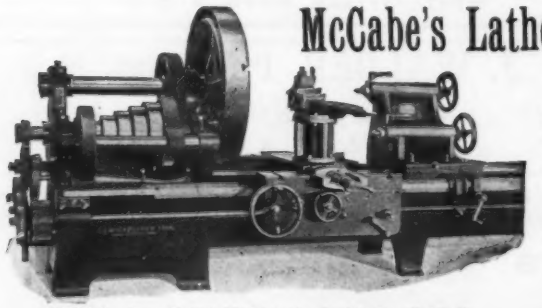
ALSO ON THE

HOT AIR SYSTEM when great capacity is wanted.

DYE STICKS, Kettle Sticks and dry and sulphur house Poles, also Sticks to suit the Wolstenholm Machine from natural water grown cedar, and Sticks to suit the Klauder-Weldon, Lorimer and Hussong machines from finer grades of lumber. These Sticks have been thoroughly tested, and pronounced the best on the market. Guarantee satisfaction to buyers. Write for prices.

Works at Braddock, P. O. Address. Cedar Brook, Camden County, N. J.

McCabe's Lathe Runs and Runs and Runs



McCabe's "New Style" 26-48 inch "Double-Spindle" Lathe.

There's no "Let Up."
If one spindle isn't running, then the other is.
It's "all day" with "Two-spindle" Lathes.

Run it as a 48-in. Triple-geared.
Run it as a 26-in. Back-geared.

Built to stand the "gaff," but they don't "stand you in" but half the expense of a 48-in. lathe.

Won't take much "guff," on our part to place one in your shop. Bet catalog will do it—that's all.

J. J. McCABE, 14 Dey Street, **NEW YORK CITY.**

THE L. M. BOWES COMPANY,

Every Description of Fine Leather for Textile Use.

SOLE AGENTS IN THE UNITED STATES FOR

CHARLES CAIN, SON & GREENWOOD,

HALIFAX, ENGLAND.

MAKERS OF HIGH GRADE

CARD CLOTHING

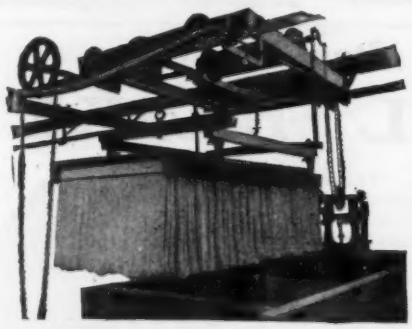
For Cotton, Woolen, Worsted and Silk.

451 ATLANTIC AVENUE, - - - - BOSTON, MASS.

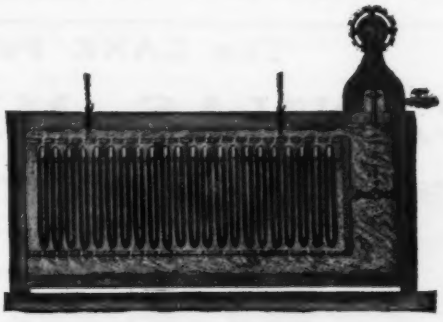
The Hussong Dyeing Machine

Patented Nov. 6, 1900. April 9, 1901. Nov. 29, 1904.

A PERFECT SKEIN DYEING MACHINE



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor. Makes No Waste Whatever. No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

Built by the **American Dyeing Machine Co., Office 609 Pearl St., Camden, N. J.**

BEWARE OF INFRINGEMENTS.

THE COHNEN

CENTRIFUGAL

Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock
or
Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS

without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING

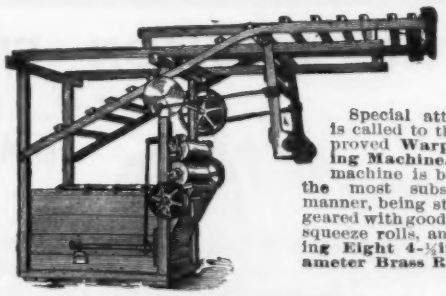
is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

A. KLIPSTEIN & CO., 122 Pearl St., NEW YORK.

DYEING MACHINES
JOHN W. FRIES
WINSTON-SALEM, N.C.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-½in. Diameter Brass Rolls.**

This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

CHARLES HART,

Hedge and Brown Streets, **FRANKFORD, PHILA.**

SEVERIN HEUSCH, Aachen, Germany,

Specialist in the Manufacture of

Spirals and Ledger Blades for Shearing Machines

of all kinds. The oldest Cloth Shearing Knife Mfr. in Germany.
American Agents Wanted.

The LANE Patent Steel-Frame

CANVAS MILL BASKET

FIG. 22.

Made of extra cotton duck. Frame of round spring steel and guaranteed against breakage. Rim bound with leather. Perfectly smooth inside. Light weight, strong and durable.

There are other special features in Lane Baskets to which is due their widely increasing popularity. Write for price list to

W. T. Lane & Brother,

MANUFACTURERS,

Poughkeepsie, N. Y.

FIG. 27

Sold by Leading Mill Supply Houses.

Try Dixon's

SOLID BELT DRESSING

AN INSTANT CURE
FOR SLIPPING BELTS

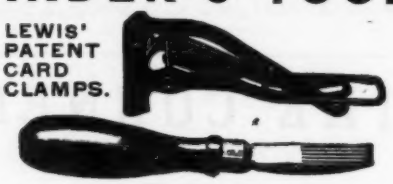
In 1-lb. bars of convenient shape.

SAMPLE BAR FREE.

JOSEPH DIXON CRUCIBLE COMPANY,
Jersey City, N. J.

CARDER'S TOOLS

LEWIS' PATENT CARD CLAMPS.



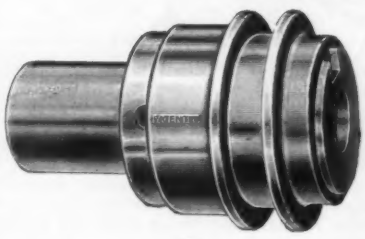
Gardner & Reid's Card Tooth Raiser.

For Setting Up Bent Teeth of Card Clothing with a variety of all other tools used by Carders and Manufacturers.
Send for circular.

W. H. BROWN, No. 81 Mechanic Street, WORCESTER, MASS.

THE JOHNSON FRICTION CLUTCHES

SINGLE AND DOUBLE



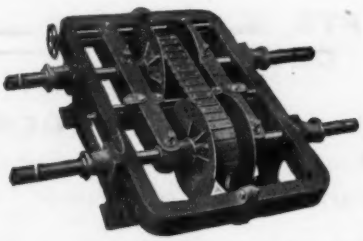
For Machines, Countershafts, Lineshafts, Etc.

They are especially adapted for Textile Machinery. Very compact, powerful and neat, having a perfectly smooth surface eliminating the possibility of accidents. They can be instantly adjusted, as required, by one screw. Operate easily and work perfectly at any speed. They are being used by many of the leading manufacturers who endorse them in the highest terms.

Write for Catalogue.

THE CARLYLE JOHNSON MACHINE CO., - Hartford, Conn., U. S. A.

THE EVER VARYING CONDITIONS which must be contended with in textile mills demand a change of speed on many machines and make it desirable on nearly all.



"The REEVES"

Variable Speed Transmission

gives any speed from fast to slow with the most delicate in-between graduations. Simply moving hand lever gets the speed you need.

Write to-day for catalog. Let us tell you exactly what the transmission will do for you and what it will cost. Let us send you a blue print showing how it may be best installed.

REEVES PULLEY CO., Columbus, Ind.

When in need of pulleys get catalogue of celebrated "THE REEVES" WOOD SPLIT PULLEYS.

TO USERS OF AUXILIARY POWER.

THE HUMPHREY AUTOMATIC CLUTCH IS WHAT YOU NEED.

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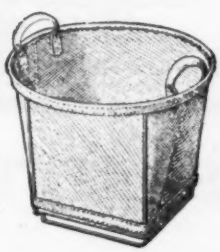

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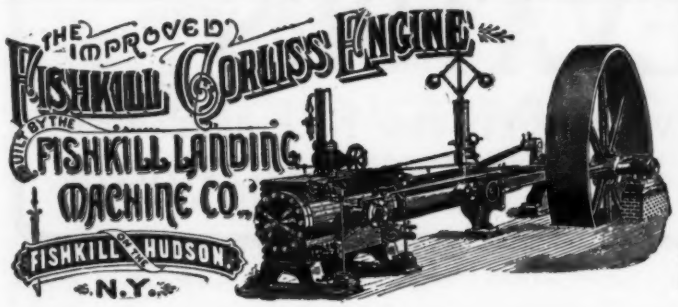

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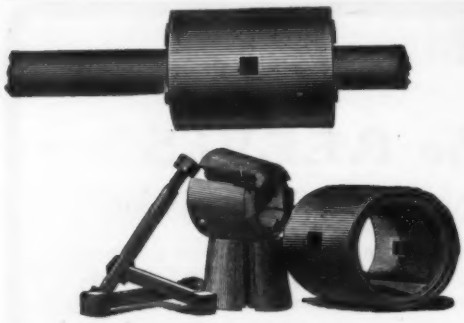

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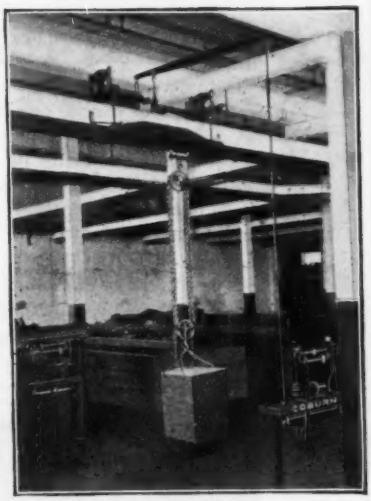

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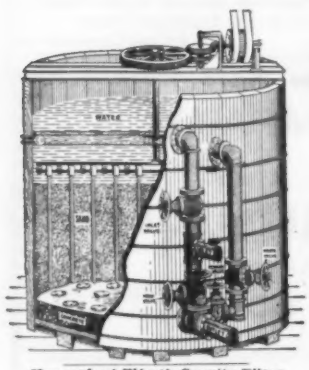

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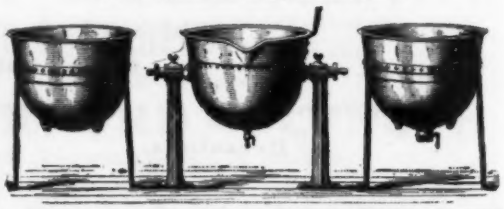

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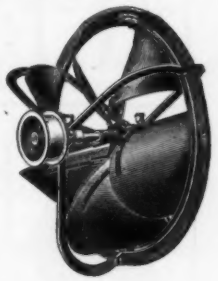

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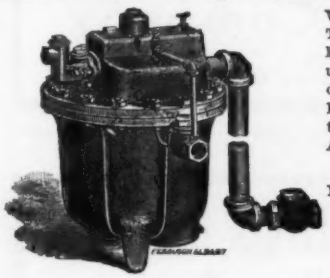

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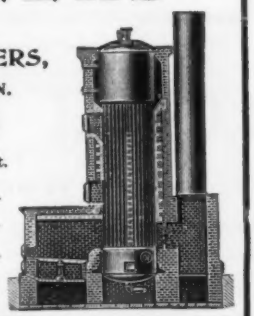

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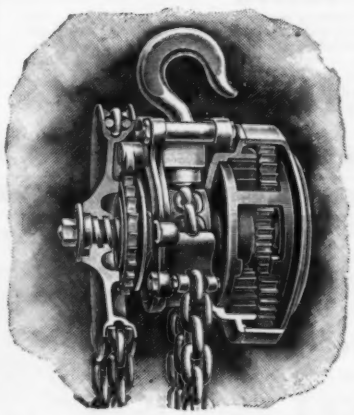

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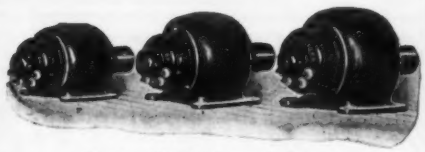

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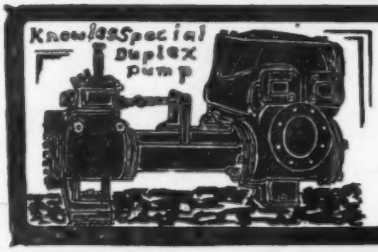

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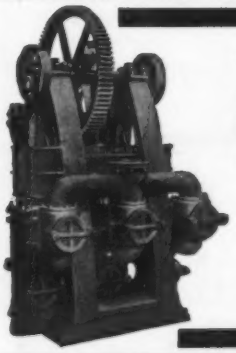

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Part II. Yarn Trade Index. List of Yarn Manufacturers classified, telling what kind and sizes of yarn is spun. List of Yarn Dealers and Agents.

Part III. Classified List of Commission and Order Mills, Dyeing and Finishing Establishments. Commission and Order Work. Bleaching, Dyeing, Printing and Finishing. Shoddy and Extract Manufacturers.

Part IV. Dealers in Raw Material and Stock. Wool and Shoddy Dealers and Brokers. Cotton Dealers and Brokers. Wholesale Rag Dealers.

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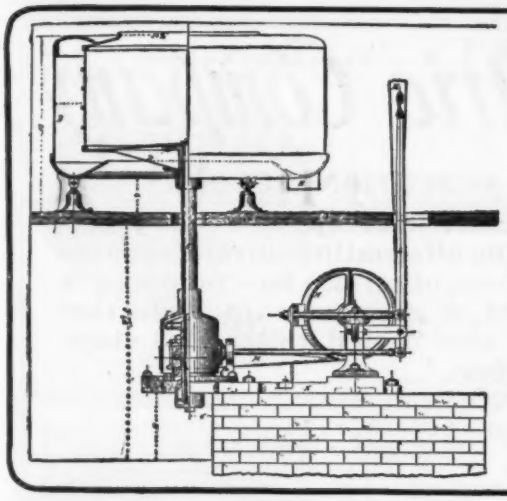

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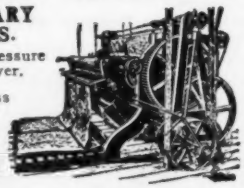

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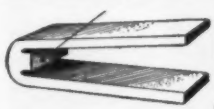

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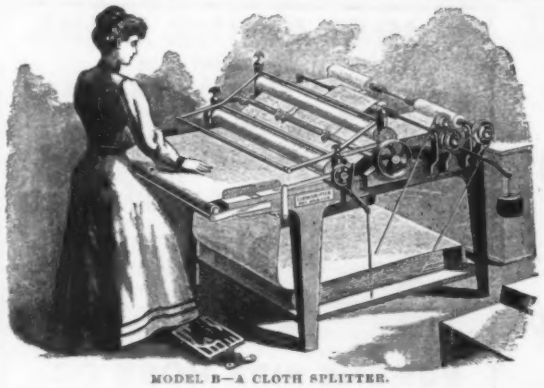

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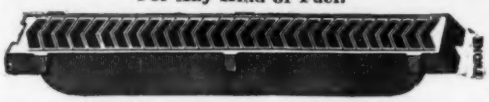

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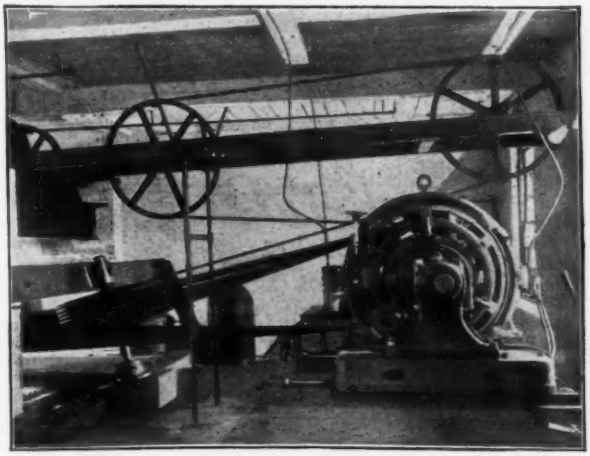

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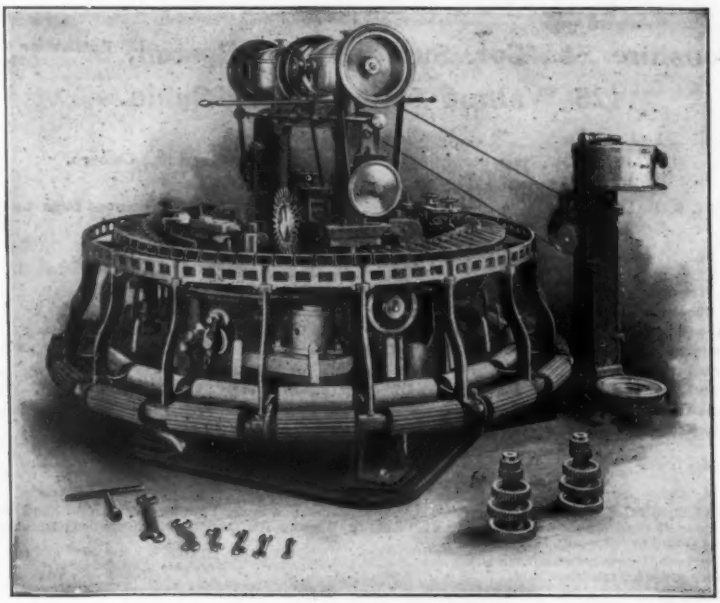

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VOL. 29. (NEW SERIES.) JULY, 1905 No. 4.

Monthly Comment.

The Labor Question North and South.

From cotton manufacturers in the South and in the North there are complaints of scarcity of help. From all accounts it would seem that this scarcity is more pronounced in the Southern States than in New England, and all sorts of schemes are proposed to remedy the difficulty. The supply of available native Southern white help for the cotton mills is nearing its limit. Southern manufacturers dislike to take Northern help into their mills, even if it were possible to induce them to go, as they fear the labor union doctrines they would bring, would demoralize the Southern help.

Various schemes have been suggested for importing foreign help, but in two instances which were brought to our attention recently these foreigners have not met with a hearty welcome from the native operatives. A large knitting mill in West Virginia which attempted to supply its need of additional help by importing Hungarians found itself with a strike on its hands, and the foreigners had to be sent away. We understand that a colony of seventy-five or one hundred Germans imported by a North Carolina mill did not assimilate well with the local help and were soon scattered far and wide.

In Northern mills the old custom of stealing help from other mills has been practiced to a great extent in the last few months. The superintendent and overseer are valued in proportion to their ability to get and hold good family help. It is the old question of supply and demand, and just now the demand seems to be in excess of the supply, and it will be strange if it does not have the effect of winning for the operatives in the South, and possibly in the North, some concessions in the way of shorter hours and higher wages.

The Massachusetts Bureau of Statistics of Labor has recently published an interesting report of cotton manfactures in Massachusetts as compared with the Southern States. Two representatives were sent to visit mills in North Carolina, South Carolina and Georgia, and while the comparatively small number of mills visited does not give to their figures the full weight of comprehensive statistics, it does give without doubt an authoritative statement of Southern mill conditions which, while containing nothing new to a close student of the situation, present some comparative statistics which bear out the statement in regard to the difference in wages, length of working hours, and child labor laws which have been frequently pointed out in these columns.

The conclusions arrived at are those which every unbiased student of economics must reach, that is, that in a country like this the conditions in the same line of manufactures

tend to equalize themselves and that equality is reached by the rising of the lower level rather than by the sinking of the higher.

The New England Cotton Manufacturers' Association has addressed a letter to the chief of the Bureau of Manufactures in which they ask that attention be given to the state laws regarding hours of labor and employment of children with ultimate end of equalizing conditions throughout the country by federal legislation.

There are constitutional questions involved as to the rights of the Federal government to regulate hours of labor in the separate states. Whether Congress undertakes to do this, or not, we believe that natural conditions will gradually bring it about. Meantime it behooves every manufacturer to see that the efficiency of every operative is utilized to its full limit by means of improved equipment, thorough organization, close supervision, and able management.

The Wool Situation.

The longest memory can not recall a more unique wool situation than the present. Formerly, it used to be held that when fine medium territory exceeded fifty cents clean it was a hazardous purchase. In June last year it was worth about 48 cents; today it is quoted around 68 cents. Nor is this all; for there are reports that Eastern merchants have already begun to negotiate for the 1906 clip, on the basis of the present prices in seaboard markets.

Obviously, this places the wool manufacturer in a difficult situation. The mills which last year failed to buy their wool early in the season were at a great disadvantage. The large manufacturers came into the market at the start and bought heavily at minimum prices. A good many of the smaller mills, thinking that wool would go no higher, held off, only to pay a big advance when they actually needed the staple to keep their machinery running. With wool 40 percent. higher, it is now a question whether they will do well or ill to repeat their dilatory policy of last year. If the manufacturer does not buy now, he may find it difficult to get his wool when the time comes for him to make his heavy weight goods; if he does buy, it is possible that when he puts his goods on the market he may discover that the public will not pay the prices he is obliged to ask. In short, while no one can tell what the situation is going to be after the first of January, the manufacturer can not rid himself of the idea that if he buys now he will do so at his risk; and yet he is almost suspicious that if he does not load up with wool at this time he may find himself in a tight situation.

It is very much harder to predict the future of wool than it was ten years ago. Factors have entered into the situation that were not dreamed of then, and the full meaning and importance of these factors have not yet been fully realized. Then it was tolerably safe to assert that 50 cents clean was the highest figure to wnich fine medium territory could safely go. But the enormous increase in the gold output of the world has dislocated the entire list of commodity prices. The annual yield of the metal is now almost double that of a decade ago. The basis of credit has been correspondingly broadened, and prices of every character have risen with startling rapidity. The stock market does not exemplify this any more strikingly than the wool market. But a rising tendency of this character can easily be carried too far without the fact being perceived. The wool manufacturer is of course conscious of this, and after such an advance as that of the last twelve months is bound to ask himself if his commodity is anywhere near that point.

He cannot answer this question with any certainty. The most he can do is to tell himself that wool has risen in price somewhat out of proportion to commodities in general. But even this does not solve his problem, for the wool situation has special features of its own which must be taken into account. While the increasing prosperity of the world, due to the extraordinary enlargement in the output of gold, has naturally increased the demand for wool fabrics, the supplies of the staple from which this demand must be satisfied are relatively at a phenomenally low point. So that, other things being equal, it would seem that wool could properly sell at above the general level of commodity prices.

But granting all this, it is a question in a

good many minds if wool quotations have not reached a point beyond which they can not be carried without considerable risk. Two factors call for attention. Consider, in the first place, the purchasing power of the masses. There has probably never been a period in the history of the world when new wealth has been created so fast as during the past ten years. The masses have shared in this increase, but proportionately the larger share of the gain has gone elsewhere. The great enlargement in the gold supply has put up wages as well as prices, but not to anything like the same extent. Hence the masses are obliged to use considerable circumspection in making their purchases. The rise in the necessaries of life has for a long time been telling upon their pocket-books, and they have felt the need of economizing wherever possible. The public has shown pretty clearly in recent years that it is more disposed to resist an advance in wearing apparel than in almost anything else. The manufacturers have met this tendency by keeping down the price of cloths to the old level, while at the same time reducing the quality of the fabrics. They have been obliged to do this; they have not been able to supply goods at the figures demanded by the public except by a constantly increasing use of substitutes. If, six or seven months from now, they cannot secure an advance on wool goods—which must appear to them by no means certain—the present quotations on the staple will very likely prove burdensome, to say nothing of any higher figures that may be made between now and then.

In the past, the wool trade and the wool manufacturers have been too prone to ignore that economic factor known as "purchasing power." They have based their actions too much on the "visible supply." They have talked a good deal about a "wool famine," and many of them have argued that the public would have no choice but to pay the prices asked. The weakness of this argument has been shown over and over again, but the error dies hard.

There is another very important factor which must be kept in mind. The wool market and the goods market are at the beck of the money market. There is a point at which the banks will be unwilling or unable to finance wool. Money is easy at present, but the money market is not without its contingencies. It is easily conceivable that events of unusual importance may occur in Europe in the near future to put rates on a materially higher level. And the condition of our own national treasury may possibly tell adversely on interest rates this fall and winter. Uncle Sam is spending a great deal more than he is taking in. He is drawing heavily upon his accumulated surplus, and this fall he will be unable to afford his customary aid to the money market at the crop moving period. While it would be rash to predict a money stringency later in the year, it is nevertheless quite conceivable that rates may acquire sufficient firmness to preclude the financing of wool at materially higher prices than the present.

In this connection it may be profitable to recall the experience of London in 1899 and 1900. The former year witnessed the great bull speculation in wool in that market. Prices had an extraordinary rise on the strength of an alleged wool famine. The best expert opinion was that the statistical position of the commodity warranted extraordinary quotations. But 1900 was a very distressing year in the London market. Mr. Sauerbeck, the celebrated statistician, said, in reviewing 1900: "The past year has been disastrous to the woolen trade and industry unparalleled within living memory. It opened under the fairest auspices, with machinery everywhere fully and profitably employed, and with a practically universal feeling of confidence. The consumption was large, the supplies had been, and, were still, decreasing, and though the value of the article was no doubt high, it seemed justified by the substantial contraction which the production of fine wool had experienced during the past five years. Yet, without warning of any kind, the whole structure of prosperity tumbled to pieces, involving the entire trade in the most formidable losses, and reducing the value of the article to the lowest level ever known."

What was the trouble? Why, simply that in the early days of 1900 the London bankers told the wool trade that they could not carry the commodity for them at the prices which

had been reached. The situation was strictly analogous to that in the stock market in the fall of 1902, when the great London bankers told the big American financiers that they must liquidate the loans they had obtained in that market for the purpose of floating huge American trusts. It goes without saying that by nobody is the present extraordinary movement in wool being so sharply scrutinized as by the banks.

Chinese Exclusion and Exports.

The growing importance of our export trade, especially with China, is emphasized by the protest of cotton manufacturers at the treatment accorded several cultivated Chinese gentlemen entering the country at the port of Boston on their way home across the continent.

Apparently no discrimination has been made between intelligent and well-to-do merchants and travelers and the coolie laborers, against whom the exclusion laws were aimed. The treaty with China in 1880, upon which the present immigration laws should be based, distinctly "regulates,' limits or suspends the coming of Chinese laborers to the United States," and not other classes. Not even the most rabid friend of American labor has objected to the visits of the educated Chinese merchants and travelers, and it should surely be no part of our government's policy to affront such people.

Already our stupid attitude has given rise to ill feeling and prejudice against American goods, even going so far as a threatened boycott by the influential Chinese guilds. The cotton manufacturers of New England, the cotton manufacturers of the South and the merchants and exporters of New York made a strong appeal to the President to modify the present interpretation of the exclusion regulations by the immigration officers until a new treaty may be arranged.

The President has sent a strongly worded letter to the Secretary of Commerce who has issued instructions to modify the regulations so that Chinese merchants, students and travelers will not be subjected to annoyances of this kind in the future.

The importance of China's good will to American cotton manufacturers is shown by the fact that our exports of cotton cloth to the Chinese empire for the ten months ending April 30, 1905, were valued at $21,125,838, out of a total to all countries of $32,071,577, and well-informed men in the trade estimate there are $10,000,000 of cloth orders for China now in hand. A little friendly reciprocity is in order.

Made in the United States.

The prejudice which has existed in favor of imported textile fabrics is gradually wearing away. Most of it is due to the easy habit of salesmen, tailors and dressmakers assuring customers that their best fabrics are imported. The wholesale and manufacturing trade know that the American mills today are turning out high-grade fabrics which compare favorably with the best European product. The acknowledged prominence of the United States in the world's affairs and her foremost position in many lines of industry have undoubtedly done much to overcome the feeling that we must go abroad for the best in textiles. Some of this season's mohair and lustre dress goods fabrics are wonderfully good and superior in design and finish to imported goods.

Cheap Labor and Uniform Yarn.

Uniformity in the size of yarn is one of the prime requisites for the successful manufacture of textiles. Absolute uniformity in yarn is impossible, but the limits within which differences in size can be tolerated vary with the class of goods and profit in manufacturing. A slight variation in the yarn count may make the finished goods unmerchantable. In all cases where goods are sold by the yard the cost per yard is directly affected by any variation in the size of the yarn. A less length of cloth is obtained from heavy yarn than from an equal weight of finer yarn. The irregularity in the size of yarns spun in the mills of India has been a cause of much complaint on the part of weavers and yarn dealers who some time ago induced the Government to propose a law providing penalties for offer-

ing for sale yarn of which any single hank varied more than 5 per cent. from the nominal count. The manufacturers were asked by the Government to appoint one of their number to serve on the Government committee to consider the question. That committee decided in favor of the proposed measure, but the representative of the manufacturers, although in a hopeless minority such a vigorous protest in the minority as far as numbers was concerned, made report that the Government decided to overrule the majority and accept the dissenting opinion, which was obviously based on facts. The following extracts from the minority report give an interesting view of the conditions in the textile industry where wages are on a level of 5 to 20 cents per day:

In India it would be altogether out of the question to turn out a single bale of yarn every hank of which would, within a margin of 5 per cent., show the same count throughout. The mill operatives here are not skilled hands, and are not reliable in carrying out instructions. The labor question is giving us enough trouble to cope with, as it is, without the law requiring to aggravate it with provisions which it is impossible to observe. Moreover, we are handicapped in the supply of our cotton, which is not of uniform quality. Wrapping reports in Bombay, giving the result of variations under the best conditions, have shown conclusively, and to my own knowledge, that a margin of 5 per cent. difference is totally inadequate, as the variations in wrapping amount to over 10 per cent. Moreover, with the class of operatives we have to reckon with, we cannot for a single hour be sure that single or double ends will not be spun, and in many cases a cop or a bobbin which holds a greater length than a hank may contain single or double yarn. The difference in such hanks from the standard test would be great, and therefore, unless the average of all the hanks of one bundle is taken, the spinner will have to answer for results which he could not control. Having affirmed it as my conviction that the 5 per cent. basis is impracticable, I would add that I believe it to be impossible for any mill to escape conviction under the hank tests on a 5 per cent. basis. As the intention of the Government of India is to check the practice of short-reeling and not to hamper the industry, I hope that the modification I suggest may be accepted by them. I would propose as a modification, which I believe would receive general approval in this country, that the average count of a whole bundle of yarn should form the basis of a test.

Imported yarn should be subject to the same conditions as the local product. There is reason to believe that the present customs procedure in respect of imported yarns does not prevent the importation of short-reeled yarns. There appears, therefore, no good reason why imported yarn found short-reeled in the Indian market should not be subject to the rules now drafted. If it is contended that imported yarn is not favored with the same concessions as the local product in respect of count and length, I believe that it would be preferable then to allow them similar concessions, and at the same time subject them to the same restrictions, in actual practice, in order to compete on equal terms. It must be remembered, however, that the concession allowed to local yarn was permitted only as a matter of vital necessity, i. e., as an essential set-off against conditions not existing elsewhere. Our yarn may be tested when and where and as often as it is deemed fit, while in actual practice the imported yarn, once it has passed the customs, escapes all further restrictions.

The Adulteration of Silk Goods.

We have frequently called attention to the serious damage to the silk trade by reason of the excessive weighting of the material. This practice has brought many lines of silk goods into deserved disrepute, particularly on the Continent of Europe, American trade having likewise felt the ill effects of the abuse. A few shrewd manufacturers have avoided extra weighting and acquired a high reputation for reliable products, which has proved a valuable asset. It is an interesting fact and one characteristic of the Japanese that the growth of this silk weighting abuse in Japan has been met by stringent regulations, calculated to maintain the quality at a high standard. A recent official order of the Japanese Government referring particularly to the silk fabric known as habutai, of which large quantities are exported from Japan, is as follows:

The weight of habutai intended for export must not be increased by dampening. In the manufacture of habutai none of the following articles can be used: Magnesium, salt, sugar; the Minister of Commerce and Industry is authorized to extend this list of prohibited materials. Goods manufactured contrary to these regulations cannot be sold, transferred or exported. The manufacturer must attach to every piece a label bearing the name of the manufacturer, where and when made, giving the year, month and day; also the number of the piece. Each manufacturer is required to keep a record of every piece delivered, giving the year, month and day of delivery, number of piece, and weight of the unfinished habutai; and the year, month and day when finished; the weight of the habutai after the process of finishing, and the weight of the goods when offered for sale. Each book must be kept at least a year after the last

entry in it has been made. The firms engaged in the export of habutai are required to submit their books and stock to the inspection of officers authorized for that duty. Whoever disregards any of these regulations or makes false entries in his books will be punished by a fine of at least 25 yen ($12.75). The proprietor of an establishment will be held responsible for the acts of his agents or employees.

This regulation of silk weighting in Japan is in line with the action of several other Asiatic countries in forbidding the use of aniline dyes for coloring rugs. It has been found that such colors, which cost less and are more easily applied to the fibre, are fugitive and lack the richness of the colors obtained from vegetable dyes by the methods that have been used there for centuries. Like Japan, these Oriental countries recognize the importance of maintaining the reputation of their textile products and are adopting the policy of the individual manufacturers who have acquired a valuable reputation by refusing to be led to excessive adulteration of their goods.

Settled by Arbitration.

It is an encouraging sign that several minor textile strikes in New England mills were settled last month by arbitration. In the case of the Chicopee mill, the circumstances must have been particularly annoying to the management because of the apparently unreasonable attitude of the spoolers, who went out because a slightly reduced scale of wages was adopted with the introduction of the Barber knotters. We believe it is customary when the help are familiar with the use of this ingenious little device to make some reduction in the scale, so that the benefit of the improvement may be shared by both mill owner and operative.

The management sugges ed that the spoolers remain at work and have the matter left to an arbitration committee of three, one to be chosen by each side of the controversy and the third by the other two. The spoolers refused. The management then suggested that the spoolers go back to work at the former rate without the knotters, but this proposition was likewise declined. A member of the State Board of Arbitration endeavored to bring about a settlement, but the spoolers would have nothing to do with him. The agent, with more patience than the average mill man, offered to leave the question to a committee of any three reputable citizens, who might be chosen by the strikers themselves. Even this proposition was at first spurned by the spoolers, but at last some of the other operatives of the mill, who were gradually being thrown out of work by the obstinate stand of the spoolers, persuaded them to accept this liberal offer. The committee was chosen, and in a few hours the trouble was over, the committee recommending that the management pay the old scale for a while longer, until it should be demonstrated that the earnings of the operatives were largely increased by the use of the knotters. The management accepted the decision with good grace, and what threatened at one time to be a serious strike was averted.

In another instance the weavers in an East Brookfield woolen mill struck because of a schedule of fines imposed for imperfect work. Over 200 went out, and the plant was closed down for a week. A member of the State Board of Arbitration was then called in and the trouble adjusted to the satisfaction of all parties.

In connection with the fine question, an interesting expression of views on the subject from a number of superintendents and manufacturers will be found in another part of this issue.

A Contract Labor Case.

A young Englishman who recently arrived in this country was ordered deported on account of violation of the contract labor law. It was claimed by the agent of the mill where he was at work that the man was an expert velvet finisher and his special line of work was new in America, and that because of his peculiar skill and high grade of work he could not be called a contract laborer.

It seems that this man originally entered the country in April and after a hearing on his case was sent back to England, but immediately took a steamer for Canada and came into the United States again and went

to the position which was waiting for him. The question raised by the mill was finally settled in Washington by the Secretary of the Department of Commerce and Labor, who reversed the decision of the local commissioner and sustained the mill on the ground that he was introducing a new industry and therefore not amenable to the contract labor law.

A Textile School in Texas.

Some time ago we reported that the plan for a textile school in Texas was assuming definite shape, and that the Governor was taking active interest in the matter. We now learn that the machinery is being set up and teaching has begun. The textile school is known as "The Department of Textile Engineering of the State College at College Station, Texas." The course of instruction covers yarn manufacture, weaving and designing, and when the machinery is in full operation they expect to make cloth from the bale.

Conditions in German Mills.

The demands presented to their employers by the dyers and finishers of Glauchau and Marana, Germany, give a good idea of the condition of German workers and incidentally show by contrast how much better off are workers in American mills. The demands are classified as follows:

1. Adoption of a ten-hour day.

2. For overtime men are to receive 12 cents and women 7 1/2 cents per hour. The overtime not to extend beyond 8 p. m. The workers are to be notified through their committee one day in advance of the intention to run the works overtime.

3. Recognition of the factory committees.

4. Wages are to be paid during working time on Friday.

5. Women and girls are not to be required to lift heavy pieces.

6. Each day's work begun is to be paid for in full.

7. In carbonizing and mercerizing processes employers are to conform to the government regulations for the protection of the skin and clothing of the workers.

8. The wage list is to be hung in each work room.

The following are to be the minimum rates of wages paid: 1, Finishers, 8 cents per hour; 2, Washers, dyers and others workers, 7 1/2 cents per hour; 3, Piece dyers, 7 1/2 cents per hour; 4, Female workers, 5 cents per hour.

Silk and Coal.

A visitor to the great coal mining centres in Pennsylvania is often struck with the apparent incongruity of finding a silk mill in close proximity to a coal mine. No two industries could be more dissimilar and yet all through Pennsylvania many successful silk factories are to be found in coal mining towns, the reason being that the coal mines give employment to men only, which leaves a surplus female help for industries like silk and knitting mills, which employ mostly women.

When a silk mill is projected in a mining town the usual and very successful method is to establish a temporary training school for girls who are later to be given positions as weavers if the mill finds an adequate supply of good help. This method of training help has proved very satisfactory. It would seem as if such a plan might be profitably employed in the South where new mills are contemplated. Local help could be learning to weave while the mill is being erected.

Assignment of Wages.

A case recently occurred in Lowell which may be of interest to other manufacturers. An operative employed in the United States Bunting Co. bought an overcoat and executed an assignment of wages due from his employers. The terms of the assignment authorized the name of any future employer to be inserted, and when the man left the United States Bunting Co. and went to work for the American Woolen Co. the people from whom he bought the overcoat attached his wages. He brought suit against the company to collect same. The company of course was perfectly willing to pay the money to whomever was legally entitled to it. The judge ruled that a person could not give an assignment of wages to be earned under a future employer.

Textile Machinery in the United States.

The publication of the 1905 edition of the Annual Official Directory of the Textile Industries offers an opportunity for observing the growth of the different branches of the trade during the past year. These deductions are more accurate than those based on the new mill statistics, as the Directory figures are taken from reports received from mills, both new and old, and indicate very closely the actual machinery equipment. We have not included in this list the number of spindles in mills projected, but not yet in operation. In general the figures show a healthy growth in all branches of the textile industry.

The increase in the number of cotton spindles has been over 700,000. The increase in the Southern States is about 650,000, and in the Northern States about 50,000. Last year the increase was about equally divided between the North and South, but this year a number of mills in the South that were then projected or under construction have gone into operation and their machinery is included in this year's Directory.

	1905.	1904.	Increase.
Cotton Spindles	25,497,395	24,796,381	701,014
Cotton Looms	580,671	572,000	8,267
Cotton Spindles in—			
Northern States	16,493,441	16,443,351	50,090
Southern States	9,003,954	8,353,030	650,924

States in order of number of spindles—

	1905	1904.
Massachusetts	8,695,733	8,674,393
South Carolina	3,213,744	2,944,114
Rhode Island	2,409,668	2,443,268
North Carolina	2,242,931	2,051,559
Georgia	1,592,524	1,499,917
New Hampshire	1,313,721	1,331,037
Connecticut	1,221,015	1,158,945
Maine	910,672	908,136
New York	807,562	804,958
Alabama	795,390	664,828
	23,202,960	22,581,155

The order of States in number of spindles remains unchanged, Massachusetts being still far in the lead with more than one-third of the total number of spindles in the country. South Carolina is second with 3,213,744. This State shows the greatest gain in the number of spindles during the year, about 250,000 increase. North Carolina is pressing Rhode Island closely, and with another year of increase like the last,—about 200,000 spindles —will be likely to lead its Northern rival. The list of the ten leading States in cotton manufactures contains the names of six Northern States and four Southern. These ten States contain 23,200,000 spindles out of the 25,500,000 spindles in the entire country.

In the wool section of the industry the figures showing a decrease in number of wool cards were at first perplexing; they have been carefully verified, and we believe the decrease is due to an increasing use of cotton and worsted yarns in wool and worsted fabrics. The number of woolen and worsted looms shows a normal increase over 1904, viz., 2,902, which is a much larger increase than 1904 showed over 1903, only 1,706. The number of worsted combs has increased 40, as compared with an increase of 9 in the preceding year. The decrease in wool cards has been principally in Pennsylvania, and when analyzed is found to be due in some measure to the abandonment of carding and spinning machinery by many weaving mills.

	1905.	1904.	Decrease.
Wool Cards—			
In New England	3,805	3,868	* 63
In Other States	3,627	3,874	*247
	7,432	7,742	*310

	1905.	1904.	Increase.
Worsted Combs—			
In New England	932	906	26
In Other States	739	725	14
	1,671	1,631	40

The comparison of knitting machinery is not wholly satisfactory because all classes of knitting machines are taken together. This does not afford such a tangible basis for comparison, but as the same rule has been followed in previous years the figures are of some interest. In this branch also the South shows a large increase in the number of machines in operation, having now almost as many as the Western States. New York, New Jersey and Pennsylvania still retain their great lead in this branch, with more than half the knitting machines in the country.

Woolen and Worsted Looms	87,915	85,013	2,902
Knitting Machines—			
N. Y., N. J., Penn.	53,376	52,914	462
New England	16,032	15,046	986
Southern States	14,436	12,286	2,150
Western States	15,851	15,962	*111
	99,695	96,208	3,487
Silk Looms—			
New Jersey	28,644	27,301	1,343
Pennsylvania	23,445	22,707	738
New York	6,809	7,869	*1,060
	68,253	66,453	1,800

—*Decrease.

These same States are the strongholds of the silk industry as well, containing 58,898 silk looms out of a total of 68,253.

There are 624 new textile establishments reported in the 1905 edition, and 759 names of mills which appeared in the 1904 edition have been taken out. While this is a slight falling off in number it is by no means due to a decline in the industry, as most of the names omitted were those of small concerns, many of them custom mills and small flax mills in the Western States, and greater care has been exercised than ever before to omit the names of defunct enterprises. That the textile industry has been generally prosperous is shown by the increase in machinery employed.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

There is little activity apparent in the men's wear district, yet an undercurrent of strength seems to prevail, and the consensus of opinion warrants the statement that the heavy weight season now about to terminate has proved one of the best in years past. Some two months ago many of the selling agents bewailed the lack of business, but this was due to the fact that the clothiers had not received sufficient time to move the stock on hand, and were also waiting to learn from the retailers what fabrics would prove the most popular. Toward the end of May duplicates began to come in for fancy overcoatings, kerseys and freizes, and these duplicates have continued to be received up to the present writing with considerable regularity, until the volume of business has exceeded that of last year by a very satisfactory margin.

The volume of the duplicate demand for freizes has been somewhat of a surprise, but it is stated that there will not be a shortage, as most mills possess the necessary facilities for increasing their production on this class of goods. The duplicate business on kerseys has reached more than normal proportions with the result that desirable numbers are now hard to secure. Interest is now centered in the opening of light weights, and quite a number of lines of low grade 3/4 goods are being shown. Higher price level is the rule with few exceptions, and there are many instances where the fabrics have been so changed and manipulated that they do not resemble those of last year in anything but the price quotation. It is stated in some quarters that they have already met with a favorable reception, and that considerable volume of yardage has been disposed of; but the trade on the whole is by no means ready to place business as early as this, and there are comparatively few buyers in the market.

The late offerings in greenish effects have not caused much of a stir in the trade, and few orders are coming in now for these cloths. The styles shown appear to be more pronounced than those which have been in vogue for the last three or four years; but it is said that the plain solid color fabrics have up to the present been the best sellers.

Among the lines of low grade goods shown by the American Woolen Company in Dept. 3 there are 50 numbers ranging in price from 55 cents to $1.00. Many are new fabrics and thus no comparison in price can be made with those of last year. Out of the fifty only six lines are the same as last year. The same company is showing a 12 oz. all-wool goods made by the Chase Mills at 77 1/2 cents.

Mackintosh, Taft & MacKenny are showing the lines of W. E. Hayward & Co. comprising suitings, thibets, plaids and twists at an average advance of 5 per cent. over last year. The same house is showing the lines

of the Charles River Woolen Co. at approximately the same ratio of advance.

H. W. T. Mali & Co. are showing the Stratford cassimeres at 47 1/2 cents. H. & W. H. Lewis have opened their entire line of 3/4 and 6/4 low grade cassimeres. Parker, Wilder & Co. are showing Concord thibets from 72 1/2 cents to $1.60, unfinished worsteds from $1.35 to $1.60.

W. J. Dickey & Sons are showing their lines of 6/4 cassimeres 13 oz. at 67 1/2, 72 1/2 and 75 cents, also the Gwinn Park cassimeres 13 oz. at 62 1/2 and 65 cents. S. H. & H. B. Newhouse are showing the Glenside 6/4 cassimeres at 85 cents, the Delance 3/4 worsteds at 27 1/2 cents and the Oakdale worsteds at 25 cents.

DRESS GOODS.

The condition of the dress goods division is spoken of as being in a healthy condition, and the volume of business received daily from road men is eminently satisfactory to both the domestic selling agent and the importer; cutters have also been in the market, and the volume of business from this source has already exceeded the yardage placed a year ago. Late developments clearly point that the coming season will be preponderantly in favor of plain colors. There are of necessity a number of fancy lines that have met with unqualified success, but the shades and colorings are more pronounced and possess an individual character entirely different from the accustomed fancies of past seasons. The shades predominant are rose, green, plum and brown in a wide variety of shades. Naturally price quotations are on a higher level than last season, but this has only retarded a few buyers from placing orders for their usual supply, as they have time and again been educated to the fact that it is absolutely impossible to quote last year's prices when the divergence in the price of the raw material is so widely marked. And from present outlook the indications are that quotations will be still higher than they now are, hence there is nothing in the present situation to undermine the confidence of buyers, or to justify them in curtailing orders.

Some months ago broadcloth had achieved first place, and there is every reason to believe that its supremacy will last for some considerable time. It can be truly stated that the leaders of fashion have demonstrated their good common sense in giving this fabric its particular favor, for no other fabric lends itself quite so well as the soft finish medium or light weight for the severe, simple styles and withal handsome tailor made costumes. The next selling fabric is the plain henrietta. Within the past few months this soft, clinging material has forged to the front, until today it is a close second to broadcloth.

The position attained by these fabrics is eminently satisfactory to the trade, as there is little element of chance in the manufacture and handling of staple goods of this nature, and the principal difficulty with the importer as well as the domestic manufacturer is to produce sufficient to supply the demand. On all sides complaints are heard that commission agents are so very dilatory with their deliveries.

The next fabric in popular favor is the mohair, which shows little diminution in the request, although primarily considered a material suitable for summer wear. It is shown in an unlimited variety of weaves and styles, and this in addition to its wearing qualities commends it for a number of purposes. It is made up into beautiful costumes, and no material gives more thorough satisfaction than a mohair dress for children. The market is still more or less short of the cream shades, and such condition has existed now for some time.

The sale of Panama weaves continues to give the manufacturers expectations, while the same may be said in regard to voiles and veilings generally, while French serges have in a large measure taken the place of cheviots.

SILKS.

The boom that fancy silks experienced during last fall and early spring is somewhat on the wane. It cannot exactly be called a reaction for the reason that the same quantity of fancy silks are not used during the winter season. Print warps are no longer in the forefront, but the request for the small jacquard and the hair line stripe is fairly well maintained. Moires are being revived, not so much in the plain colors as in the two-

toned effects similar to Fig. 1 manufactured by the house of M. C. Migel & Co. in 21-inch at 85 cents. This character of goods has met with very favorable reception. The combinations most popular are green and purple.

The vogue for plaids is considerably augmented and the outlook for a good fall demand is most promising.

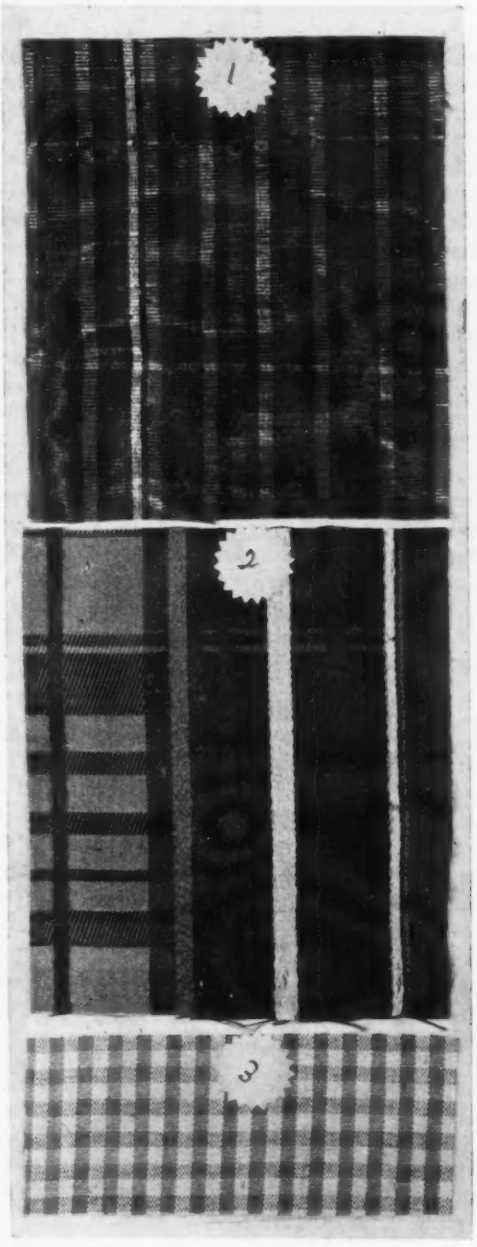
The collections shown by the various manufacturers are most extensive, comprising tartans, medium and small plaids, overchecks and small checks in louisines, taffetas, surahs, poplins and in all the different color combinations. Fig. 2 illustrates a 21-inch plaid produced by Dexter, Lambert & Co. at 90 cents. The request for plain colored taffetas is beyond the corresponding month of last year; while the orders booked for black taffetas, black peau de soies, messalines and other silk weaves indicate that in a large measure black will predominate. Quotations on the whole are well maintained, although occasional concessions can be obtained.

It is now fully assured that the vogue for velvets will be as strong as that of last fall, and several indications seem to point that the demand will eclipse that of several seasons past. Many novelties have been produced by the various domestic manufacturers, but the "Shadow" velvet brought out by A. Wimpheimer & Bros. deserves special comment. This is an article in silk velvet which produces two-toned effects of the same shade, or in other words, in the wearing of this velvet a scintillating effect is produced and will be much used this fall in costumes and waists.

Another strong feature in velvet, known as chiffon paon velvet, is already much in request, being light weight, lustrous and extensively used for costumes, waists and also for millinery purposes. Chiffon velveteen also promises to be exceedingly popular on account of its feather weight lightness, fastness of color and lustre.

COTTONS, WASH GOODS AND PRINTS.

The domestic market is bare of supplies on many lines and shows a strong upward tendency, and in a number of instances old figures are refused for spot deliveries. This is due to the sold-up condition of the mills as much as the advance of raw material. Ticks and shirting plaid are well situated, the latter being taken in large quantities for export.



The clearance sales inaugurated by the various jobbers during the last week in June, mark the closing period of the wash goods

business for the year 1905. The season's trade on lawns, printed batistes and fabrics of that character, is spoken of as being moderately good, and the volume of yardage disposed of about an average. There has been no scarcity of goods with the exception of a few low grade lines. Prices are well maintained and even during the sales concessions of only 1/2 cent to one cent a yard could be obtained on goods below 12 1/2 cents.

Dress as well as staple ginghams are strong, but up to the present no advances have been made. Mercerized check ginghams similar to Fig. 3 have been very much in request, and its popularity has reached every state in the Union, more particularly in the black and white shepherd's check. It was first introduced by the English importers, and soon duplicated by the domestic mills. The price has ranged from 14 1/2 cents to 17 1/2 cents, and owing to the lack of supply no difficulty has been experienced in securing the higher figure. Prints are now stronger than they have been for the last six months, and all the mills seem to be well situated.

Most buyers welcome the fact that no combination has been effected, as they consider present quotations sufficiently high.

WHITE GOODS.

The demand for plain staple goods continues very satisfactory; India linons, Victoria and Persian lawns are becoming rather scarce and this season the bulk of the business has been done on the plain goods of that order. Jacquards in both mercerized and mulls have not met with the same favor as hitherto, and the decline in some instances is most marked. Considerable advance business has already been transacted for 1906, the general belief being that next year white goods consumption will exceed the present.

LININGS.

The demand for linings is gradually increasing. For several seasons past the conditions existing have been most unsatisfactory to converters, but the present outlook is distinctly encouraging.

In several quarters of the market good orders are reported for mercerized finishes for early requirements. Staple goods are also showing more life. In medium and low grades of silesias and percalines, demand has also been more active. The clothing trade demand for cotton twills, Alberts and Italians has materially improved, and all indications point to a renewed activity in this division of the trade.

VALUE OF SPRINKLER PROTECTION.

In the June report of the Boston Manufacturers' Mutual Fire Insurance Company, of which Edward Atkinson is president, attention is called to the importance of putting sprinklers in places where fires seem least likely to originate. Mr. Atkinson says:

"In the ten years ending June 1, 1905, this company has paid 1652 claims for loss, averaging, each.....$ 500.23
Amount 826,389.03
Of this number, 1,622 claims averaged, each..... 182.60
Amount 296,888.51
Thirty claims in excess of $5,000 each averaged..... 17,650.00
Amount 529,500.52
In the thirty claims in excess of $5,000 each, eight fires originated in parts of mills or works over which sprinkler protection had not been extended.
Loss $200,759.70
Thirteen claims were for losses on unsprinkled storehouses.
Amount $183,486.99

"When the average loss of $17,650 on risks partially protected or without sprinklers is compared with the average loss on fully protected risks of only $182.60, the attention of members in whose works or storehouses sprinklers are still needed will be called to the necessity of taking immediate action thereon.

"This experience of ten years sustains the only safe rule: wherever a sprinkler can be put, put one, especially in the places where fire may be least likely to originate. It was in such a place that most of the fires registered above occurred, and especially the case in the one in which we met the largest loss."

The Second International Congress of Cotton Spinners.

REPORTED BY THE EDITOR OF THE TEXTILE WORLD RECORD, WHO WAS IN ATTENDANCE AS THE AMERICAN DELEGATE.

Twelve nations were represented at the second international congress of cotton spinners which met in Manchester, England, on June 5, 1905. About one hundred and seven delegates were in attendance, the first session being held in the Manchester town hall. This international association was formed during the period of high cotton prices last year to bring about common action by the spinners of the world to restrict the consumption of cotton. As a result of that scarcity the spinners of all countries reduced the running time to such an extent that the movement was unquestionably an important factor in restoring cotton prices to a lower level. The international association receives and probably deserves a large share of the credit for that short time, although the spinners would unquestionably have been forced to run on short time then even if no association had been formed. Since then one large crop of American cotton has restored the balance of supply and demand, and made the cotton spinners of the world prosperous beyond any previous record.

The European spinners, however, have not forgotten last year nor are they ignorant of the fact that another short crop may again close their mills, cause heavy losses and possibly bankruptcy to the trade. It is impossible for one familiar only with American conditions to realize the importance of the cotton supply to Europe and especially to England. Within forty miles of Manchester Town Hall there are 8,000,000 people, practically all of whom are dependent on the cotton industry for their livelihood. It is estimated that one out of every four of the inhabitants of the United Kingdom are dependent on cotton manufacturing. Under such conditions it is easy to understand the deep interest which all the people feel in the maintenance of the cotton supply. The same conditions exist only in a less degree throughout all Europe and hence the continuance of the International Congress of Cotton Spinners after the emergency which called it into being has passed.

The first session was opened in Manchester Town Hall with an address of welcome by the Lord Mayor, who was followed by the president of the Congress, Mr. C. W. Macara, in an address from which we make the following extract:

THE PRESIDENT'S ADDRESS. BY C. W. MACARA.

The recent crisis in the cotton industry brought about by the shortage of raw material and the consequent excessive speculation, has been productive of results which probably will have a most important bearing upon the future of the industry as a whole.

Those who have closely followed the working of the industry as a whole, are more and more convinced that while individual employers may continue, as in the past, to regulate the details in connection with management of their own businesses, there are now forces at work which have to be reckoned with, and which can only be dealt with successfully by associations of employers. These forces have, during recent years, gradually become more powerful, and it is therefore necessary to have federations of associations in various cotton-using countries, and recent events have proved that international federation has become a necessity if the interests of the industry as a whole are to be adequately safeguarded.

The annual average price of the cotton crop of the world has varied during the past ten years from under 4d. to as high as 7d. per lb., but taking an average of 5d. per lb., and estimating the annual crop of the world at 16,000,000 bales of 500 lbs. each, the value of the raw material would amount to £160,000,000. In England, where the cotton industry is more highly specialized than elsewhere, the cost of converting the raw material, when at an average of 5d. per lb. into finished fabrics is over one-and-a-half times the original cost, so that although less may be spent by other countries in manipulating the raw material, the annual value of the fabrics produced from cotton must be about £350,000,000. Such figures prove what an enormous factor the cotton industry is in clothing the inhabitants of the world. How many people are employed in the cultivation of the raw material, and in the numerous processes through which it passes before it is converted into clothing, it is impossible even approximately to estimate. In addition, there is the influence an industry of such dimensions exercises, not only upon all other industries and on the value of property generally, but also the employment it gives to the mercantile and banking interests, and to carriers of all kinds both by land and sea.

It is impossible to emphasize too strongly the importance of complete organization. In order to

be an effective executive force. it is necessary in the first place to be prepared to make certain sacrifices. A large yearly income and an accumulated reserve fund is an absolute necessity, but as this is spread over a wide area the individual employer's contribution is small for the benefits received. There must further be complete confidence in the men appointed on the executive committee, and when a line of action has been carefully considered and decided upon by this body it must be loyally adhered to, otherwise federation becomes a name only and not a power. This will explain the hesitation of the General Committee of the English Master Cotton Spinners' Federation with regard to international federation, but the stress of circumstances at the end of 1903 led to the initiation of a movement which resulted in the holding of the first International Congress twelve months ago. As a result of this first congress, it is confidently expected that an international federation will be formed, which may ultimately become a great factor in the regulation of the cotton industry of the world.

When it is remembered that the American cotton crop thirty years ago only averaged about 4,000,000 bales, and that this season's crop may reach 13,000,000 bales, the whole of which will be required to relieve the tension caused by the shortage during the previous years, it shows how urgent is the necessity for opening up new sources of supply. There is every indication that the development of this world-wide industry will be even greater in the future than it has been in the past. It is satisfactory, in the circumstances, that statesmen are assisting public-spirited men in furthering the extension of the growth of cotton.

The possibilities of a combination of users being sufficiently powerful to checkmate speculative operations is very great, and when it is remembered that every halfpenny per pound that is added to the average price of the cotton crop of the world in a single season means £16,000,000, and that it has been raised as much as 2d, or 3d, per lb. during the recent crisis, anything that would prevent such undue enhancement would be of inestimable benefit. A large proportion of such advances certainly does not find its way into the hands of the planters or the legitimate middlemen, but into those of the operators. It must also be borne in mind that any serious rise in the price of raw cotton undoubtedly reduces the demand for the manufactured products, and, consequently, the employment for the spindles and looms, the largest consumers of cotton goods being the poorest people in the world. Then, again, violent fluctuations in the price of the raw material interfere most seriously with the smooth working of the industry, and heavy losses are frequently incurred by those who have capital invested in it.

The remainder of the first day's session was occupied with the report of the committee, treasurer's report, and adoption of a constitution and rules. At 1 P. M. the directors of the Manchester Ship Canal Company and of the Manchester Cotton Association entertained the delegates at luncheon, after which the entire party was conducted to the ship canal docks where they inspected the facilities for transporting and handling freight at the Manchester terminal. There was but one feature to mar this trip and that was the absolutely disgraceful condition of the American cotton which was being unloaded from the vessels. The cotton must be seen here in order to appreciate this condition. A properly packed American bale is the exception. The rule is to have one or more ties broken and the cotton sticking out in great soft masses. Many of the American bales have been pressed without being wrapped in bagging, the cotton being left exposed. Others were wrapped in pieces of old bagging which had been used before and presented the appearance of a beggar in rags. Several bales were lying on the docks without ties or bagging, having been stripped of both by being lifted from the hold of the vessel. And then the marks! A splash of red or green painted on a piece of ragged bagging, looking as if the bale had been rubbed against a freshly painted fence was all that indicated the number and grade. It is remarkable how many marks the man on the dock is able to decipher. I am told he becomes wonderfully proficient. He read a few splashes of paint for me, and I wondered if his reputation for proficiency was due in any degree to the fact that no one could dispute his readings. He is compelled to give up reading marks when none can be found and the result is a large percentage of "no mark" bales, which have to be divided proportionately among the consignees. This causes much expense and dissatisfaction. A large amount of cotton is wasted. As much as possible of the loose stock is collected and divided proportionately, as in the case of "no mark" bales. The collecting of loose cotton around the Liverpool docks, and selling it to the mills is an industry that supports a large number of people. The cotton itself is of course the best of its kind in the world and it makes one's blood boil to see such a valuable natural product handled in such a careless, slipshod, wasteful manner. No wonder the spinners of Europe are striving to secure new sources of cotton supply. The methods of baling the American crop are alone a sufficient incentive in this work.

On Monday evening the Lord Mayor and Corporation of Manchester gave a reception to the delegates. On Tuesday the chairman of the day was Herr Arthur Kuffler of Austria, who delivered an address in which he called attention to the evils of speculation in cotton and suggested certain remedies. He put the case very neatly, by saying that he was not objecting to any one betting on the rise and fall of cotton, but that he could see no reason why the spinners should lose money because some one else chose to play the game. His address was interrupted by the arrival of the American delegate, Samuel S. Dale, who was accorded a most enthusiastic welcome. The delegates rose to their feet, waved and clapped their hands and cheered vociferously for several minutes. It was a remarkable demonstration of international good will to America. The delegates of eleven nations vied with each other in this spontaneous and informal reception to America. After this pleasing interruption Herr Kuffler finished his address and the remainder of the session was occupied with the appointment of a secretary and other matters of organization.

At 1.30 the delegates proceeded to the Manchester Royal Exchange where they were received by the president of that institution. They afterwards visited the main hall of the exchange and from the gallery looked down upon seven thousand traders on the floor engaging in making contracts for every branch of the textile business from the purchase of the raw material to that of the finished product. The afternoon session was occupied with an address by Herr Kuffler on "The Regulation of Cotton Purchase." In the evening the delegates were entertained at a banquet given by the Lord Mayor and Corporation of Manchester in the Town Hall.

On Wednesday the chairman was Baron Costanzo Cantoni, of Italy, after whose address a very valuable paper on "Damp in Cotton" was read by Mr. H. W. Macalister, of the "Cotton" Committee of the Federation of Master Cotton Spinners' Associations, from which I take the following extracts:

DAMP IN COTTON. BY H. W. MACILISTER.

During comparatively recent years, the minds of cotton spinners have been considerably exercised by the question of damp in cotton, but as long ago as January, 1889, we find that the United Cotton Spinners of that date passed the following resolution:—

"That in conformity with the recommendation of the Damp in Cotton Committee, a levy be made upon the trade at the rate of sixpence per 1,000 spindles, for the purpose of carrying into a Court of Law some suitable case of excessive damp, and testing as to the right of the cotton spinners to recover damages in such case."

At the commencement of the current cotton season, so many serious complaints were brought before the Council of the Federation of Master Cotton Spinners' Associations, that a Cotton Committee was appointed to enquire into the subject, with a view to devising means to put a stop to this very serious evil.

The following is a list of some of the more serious cases of excess moisture which have been examined and reported upon by the Manchester Chamber of Commerce Testing House:—

Per cent. Damp in Cotton.

	1	2	3
Total moisture	13.25	15.40	11.43
Absolutely dry weight	86.75	84.60	88.57
Regain at 8 1/2 per cent.	7.37	7.19	7.53
Correct invoice weight	94,12	91.79	96.10
Excess moisture	5.88	8,21	3.90
	4	5	6
Total moisture	14.71	15.00	12,28
Absolutely dry weight	85.29	85.00	87.72
Regain at 8 1/2 per cent.	7,25	7,22	7.45
Correct invoice weight	92.54	92,22	95.17
Excess moisture	7.46	7.78	4.83
	7	8	9
Total moisture	13.33	10.60	15.50
Absolutely dry weight	86.67	89.40	84.50
Regain at 8 1/2 per cent.	7,36	7.60	7.18
Correct invoice weight	94.03	97.00	91.68
Excess moisture	5.99	3.00	8.32

A communication has also been received from a firm in Italy through the Secretary of the Manchester Cotton Association, stating that a lot of 100 bales of American cotton imported via Genoa, which the seller's agent examined at the factory, contained over 12 1/2 per cent. of moisture, some of the bales being found on opening to contain 50 and 60 lbs. of unmerchantable cotton.

The following instance is one in which special care was taken to have an exhaustive examination and test made wholly under the care of the Manchester Testing House Officials.

Their report is as follows:—

Royal Exchange, Manchester,
October, 1904.

"In accordance with your instructions we visited your mill on the 19th inst., and weighed and sampled 42 bales of cotton. The samples were taken from the top, intermediate and middle parts of the bales, and were conveyed here in air-tight tins.

	Lot 1.	Lot 2.	Lot 3.
	13 bales	14 bales	15 bales
	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.
	54 2. 20.	63. 3 .24.	69. 1. 26.
Total moisture....	13.30%	12.50%	13.90%
Absolutely dry weight	86.70%	87.50%	87.00%
Regain at 8½%...	7.37%	7.43%	7.39%
Correct invoice weight	94.07%	94.93%	94.39%
Excess moisture...	5.93%	5.07%	5.61%
Equal to a loss per bale in excess of a normal moisture of 8½% over absolute dryness respectively of..	26.60 lbs.	24.69 lbs.	26.90 lbs.

an average of 26.07 lbs, per bale upon the net weight of the bales.

In addition to the above loss shown by the Testing House report it is only right to add that the loss in weight which took place in the gross weight of the cotton, viz:—between the weight of the bales as weighed in Liverpool and the subsequent re-weight of the same bales by the Testing House Official (after making due allowance for bands removed, and samples taken out by the sellers when invesigating the complaint) was 139 lbs. or 3.31 lbs, per bale."

The allowance awarded by the arbitrators on this lot of cotton was 10 lbs. per bale, whereas the average loss to the spinner was as shown above, 26.07 lbs. per bale, according to the Testing House report, plus the loss in weight between the first and second weighings.

Assuming the weight of a bale of American cotton to be 500 lbs. net, an excess of 5 per cent. moisture adds to the cost of the cotton to the spinner

on 6d. per lb..... .315 per lb.
on 5d. per lb..... .263 per lb.
on 4d. per lb..... .210 per lb.

At today's price, say,
4.50d., an excess of 4 per cent. adds .187d. to the cost
4.50d., an excess of 3 per cent. adds .139d. to the cost
4.50d., an excess of 2 per cent. adds .091d. to the cost

With the view of obtaining the assistance and cooperation of the Liverpool Cotton Association, the Federation Cotton Committee, on the 17th Nov. last, waited upon the Directors of the Liverpool Cotton Association and laid before them for their consideration the serious loss which the trade was suffering by reason of excessive moisture, and also the fact that there was no method in use of scientifically assessing the amount of excessive moisture in cotton, and further, that when cotton was found to be more than usually damp, that the allowances made by arbitrators were in many cases totally inadequate to cover the actual loss.

The Cotton Committee suggested that endeavors should be made to establish a scientific method of ascertaining the amount of excess over normal moisture, but the Liverpool Cotton Association, in their reply, stated that their "Appeal Committee on Damp," after careful consideration, "are strongly confirmed in the opinion . . . . that the adoption of a scientific test for the adjustment of claims for damp was commercially impracticable; . . . . that damp in cotton, excessive or otherwise, was caused by the weather, and that no human effort could control it." "They were also of opinion that no seller of cotton, in America or anywhere else, would submit to sell subject to a basis of claim which arbitrarily fixed the amount of moisture in cotton of various growths and crops."

The Federation Cotton Committee, in their reply to the Liverpool Cotton Association, wrote that they could not seriously accept the conclusions placed before them, and stated that the object of the Federation Committee was not to obtain any arbitrary fixture of rules, which might be unfair to sellers, but on the contrary, to induce the Directors of the Liverpool Association to adopt regulations under which differences between sellers and buyers might be equitably adjusted, as the Committee was of opinion that sellers in America or elsewhere could not in fairness refuse to agree to rules which were equitable. They further contended that the present Liverpool Association By-Laws were not framed to deal equitably with the question of internal moisture in bales of cotton; for instance, the Liverpool Cotton Association By-Law 25, Section 6, Sub-section F, reads as follows:—

"If in the opinion of two qualified persons cotton turns out at time of delivery to be damp or wet, and if such arbitrators consider an allowance of at least 10 lbs. per bale of 480 lbs. average weight if American cotton to be due thereon (and this shall be the ratio in cases of damp occurring in growths other than American), the buyer shall have the option of closing the contract at the market price of the day, subject to the right of appeal by the seller. This forms the basis under which arbitrations for damp are conducted, and the Liverpool Appeal Committee have admitted that there have been cases of arbitration under this rule in which about 10 lbs, per bale should have been allowed, in which the allowances had not been sufficient, an instance which we have above given (the Testing House report on 42 bales) is a case in point which confirms that conclusion.

By-Law 25, Section 1, Sub-section 1 (a), reads:—"All cotton shall be warranted as represented," and we can hardly suppose that any seller whose cotton was excessively damp in the bales would contend that the sample upon which he offered the cotton for sale could possibly represent excess moisture in the bale. In earlier years American cotton was frequently weighted, sometimes excessively, with sand, but this being a very apparent adulteration, which was usually represented in the selling sample, the buyer of spot cotton was able to protect himself and this method of adulteration has practically ceased.

The rules of many of the American Cotton Exchanges deal specifically with this malpractice, and their enforcement has no doubt contributed to this beneficial result.

Excess moisture in cotton is only another means of adulteration— much more difficult to detect and to deal with—which equitable rules would eradicate.

The Federation Cotton Committee suggested a further conference with the Liverpool Cotton Association, to discuss the question and the existing rules dealing with the subject of damp in cotton, to which they received a reply:—

That "as the Directors of the Liverpool Cotton Association are absolutely convinced that the

dampness in question is the result of atmospheric causes which are beyond control, ... such fundamental divergence of opinion renders all discussions at present useless."

We trust that the Liverpool Cotton Association, notwithstanding the strong opinion which its Directors have expressed as to the cause of excessive moisture, will take measures to institute inquiries on the subject, for the benefit of the section of the trade which it claims to represent.

Many spinners here have no doubt found by experience that the cotton which loses most weight comes from the Eastern Cotton States.

We think that no stronger evidence could be produced for the necessity, on the part of all cotton Exchanges, to establish rules which will act as a deterrent to the damp-packing of cotton.

In other trades, notably in those of wool, silk and wood pulp, it has become an established custom to buy and sell those commodities upon an agreed-upon standard of moisture, and we see no insuperable difficulty to the establishment of a similar method of adjusting disputes in cases of excessive moisture in raw cotton.

In our opinion, however, the simplest plan in the first place is to root out the evil at its source, which appears from the above evidence to arise at the ginning presses, and this duty primarily falls upon the shoulders of local Exchanges throughout the cotton-producing states. We trust that the International Committee will exercise its powerful influence with the respective National Local Associations and Cotton Exchanges which its members represent, to organize a code of Rules and Regulations which shall be equitable as between sellers and buyers dealing specifically with the assessment of claims for excessive moisture in cotton, with the object of establishing their universal adoption. In order to assist in the accomplishment of this very desirable end, we think that the opinion of this Congress, strongly expressed, would carry very great influence with the authorities of the commercial centres referred to.

The afternoon was given up to an excursion to Blackpool, the popular seaside resort of Lancashire. Luncheon was served on the journey, and on arrival the delegates were received by the Mayor and Mayoress of Blackpool at an afternoon tea. Each delegate received a pass to all the places of amusement at this great seaside resort and after a ride on the electric cars along the great boulevard next to the beach, the party dispersed in all directions to seek amusement in a place where amusement is a business. The Moxom flying machine proved a great attraction and was soon the scene of a real congress of nations, with representatives of Great Britain, France, Germany, Austria, Italy, Spain, Portugal, Switzerland, Holland, Belgium, and America flying through the air a hundred feet from the ground in a circle probably one thousand feet in circumference, clinging to the sides of the machines, all illustrating the saying that "one touch of nature makes the whole world kin," heedless of the fact that one hundred feet below them on solid ground such questions as cotton supply, weights and measures were awaiting them.

In the evening the delegates were entertained at dinner by the Mayor and Corporation of Blackpool.

The Thursday session was held at Liverpool. The party first visited the Cotton Exchange where business was suspended to give the traders an opportunity to greet the delegates with a series of rousing cheers. At the town hall the Lord Mayor of Liverpool delivered an address of welcome, after which the session was opened, the subject being "The Metric System." The first paper was read by Herr. Ferd. Gross, who was followed by Mr. J. R. Byrom, whose paper was in part as follows:

THE METRIC SYSTEM. BY JOHN R. BYROM.

I take it we all agree that a uniform system of numbering yarns is desirable from an international standpoint, and this desire will become stronger as the nations get closer together.

But the question is: Which system? I reply by asking: Which system now holds the field? There can only be one answer: It is the English yard and pound, and the hank of 840 yards, which is known and recognized throughout the world, and which, notwithstanding legal enactments and conventions, still reigns supreme.

It is over a century since the metric system was first made compulsory by law in France, and yet quite recently a French manufacturer had to submit to a considerable claim for cloth exported to a French colony, because it was folded in metres and not in English yards. The metre was there, but the yard was there before it.

I need not, however, go beyond the paper we have just heard read for proof of my position. Witness the stand taken by the "great combination of spinners, the Verband Rheinisch-Westfalischer Baumwollspinner," as quoted by my friend, and also the action of the German government in still insisting upon the retention of the English counts of yarn for their revised tariff. We do not claim perfection for the English system, but the merits of the yard and the pound are such as to command the assent and use of them by a far greater number of people than are using the metre and the gramme.

The metric system may, and does, afford facilities for many purposes, but for our trade there are no "inward, natural, or organic advantages," to be found in the metre or gramme, which are not equally found in the yard and the pound; and as the metric system having conquered the civilized world, it does not appear from the paper now under discussion, to have been finally victorious in any part of it.

The hank of 840 yards and its relation to the pound, constituting the counts or number, is the basis on which every process throughout the mill is calculated, indeed it regulates every phase of the industry from the cotton field to the retail counter, it is understood by all our work-people, and forms the mode in which we think and speak. The denomination of yarn by the counts or numbers has been carried by our commerce into every part of the world, and to alter it would involve a complete revolution, both in our mills and markets, at home and abroad, and we utterly fail to see where we should be benefited. Calculations would not be simplified, but very much complicated; our markets would not be increased, but more likely greatly restricted; it would take generations to make the new system as familiar as the present, and meanwhile confusion would reign and our trade diminish.

Coming now to section C, we join in the inquiry: How far this International Association can act in this matter? and I agree with the writer that "before the International Committee takes any further step, it will be advisable that it shall inquire in the most careful manner possible into the feelings and opinions of English spinners and manufacturers." And here let me warn our continental friends not to be led away by the resolutions passed by the Chambers of Commerce, nor even by the action of our House of Lords. In the latter case I may mention that the 'Select Committee," which sat last year to take evidence on the Bill, did not call a single witness to represent the textile trades and allied industries.

I would, however, ask them to make the most careful inquiries while in this country as to the prospects of England adopting the metric system, and I beg to assure them that anything we can do to help them to arrive at a true decision will be readily accorded. As to the feelings of English spinners, they will probably ascertain what they are without going outside this Congress.

I also agree that if a "Universal Hank" is arrived at, it would be necessary to consult the other textile trades before embarking on any scheme.

Mr. T. Roberts then read a paper which was in part as follows:

A COTTON CLOTH MANUFACTURER'S CASE AGAINST THE METRIC SYSTEM.

BY T. ROBERTS.

I wish it to be thoroughly understood at the opening of my paper that I do not object to the Metric System as a system, but in so far as the Metre—on which is based the system we are considering—and the derivatives of the Metre, are incommensurable with any of our English measurements, I have strong objections to it, and I will endeavor to point out how its introduction would be detrimentally affect the trade or business of a cotton cloth manufacturer and the internal working of the weaving mill.

The equivalents I have adopted in my calculations and comparisons are those decided upon by an International Committee, which fixed the metre (the unit of length) at 39.3707904 inches, and the gramme (the unit of weight) at .00220462 lbs, avoirdupois'.

In this country we have a very large and important trade which is called the "Dhootie," or Scarf Trade, and I would draw special attention to the most serious difficulties that the change would create in the manipulation of this style of goods. These goods are made in any lengths, and I give here a table of comparison of a few of them.

English Yards.	Metres.
2.5	2.285
3	2.743
3.5	3.2
4	3.657
5	4.572
6	5.486
7	6.4
8	7.315
9	8.229
10	9.144
11	10.058
12	10.972

Take one simple illustration—here I dare not attempt a comparison of reeds and picks—10 yards 40-inch cloth becomes 9.144 metres. 101.6 centimetres.

Any Dhootie manufacturer will agree with me that the particulars of this class of cloth are complicated enough without the change.

In this country there is a very large trade done where the particulars are given out by the merchant to the manufacturer in what are termed "inch counts," that is, the cloth must have a stipulated number of threads in the warp and in the weft, per inch.

Unfortunately, we have no exact equivalent in the metric system to our inch. The nearest we can get is:—

Millimetres.		English Inches.
25	=	0.98245
26	=	1.02362

If it were decided to use the 25 millimetres in place of the inch, then our standard would be lowered by 2 per cent., or, if the 26 millimetres were used, then our standard would be raised 2 per cent. I beg to submit, gentlemen, that a standard like ours for cloth making, which has been in use since cloth making began, should not lightly be altered. This question is a serious one, and requires the most careful thought and consideration of every merchant and manufacturer in the trade, before allowing any alteration to be made.

Using the tables as given, it will be interesting ing to take one or two illustrations as to their application by the cotton cloth manufacturer attending Manchester Exchange.

Under the present system of English terms, the manufacturer would get, say, the following inquiry:—

Inches	Yards	1/4-inch Counts	Yarns
38	38	16 × 16	34/38

Convert this inquiry to metric terms and we get the following:—

Centimetres	Metres	Per Centimetre	Metre Numbers
96.52	34.74	25.18 × 25.18	28.782/32.174

The English terms require 12 figures.

Metric Equivalents require 26 figures and 6 decimal points.

I cannot give an illustration of the comparison of "Inch Counts" reed and pick, because, as I stated earlier in my paper, there is no exact metric equivalent for our English inch.

I now give an illustration of a Dhootie cloth.

English Terms:—

Inches	Yards	1/4-inch Counts	Yarns
40	2/5	18 × 20	34/40
		1/4-inch colored border.	

Metric Terms:—

Centimetres	Metres Per Centimetre	Metre Numbers
101.6	2/4.572	28.34 × 31.49 28.775/33.853
		6.3499^{mm} colored border.

The English requires 14 figures.

Metric equivalents require 32 figures and 7 decimal points.

Last year when I had the honor of attending the First International Congress held at Zurich, a Swiss gentlemen (a cotton manufacturer) gave me his method of calculating the weight of yarn required to make a piece of cloth. I sincerely hope that gentleman will forgive me making use of his figures as an illustration against the introduction of the metric system to the cotton trade of this country.

You will notice that the particulars are not by any means in metric terms, but the resulting weight is got out in kilograms.

You will notice that method of calculation used by my Swiss friend required 329 figures, while on the English terms and method 181 figures only are required, the result being the same for all practical purposes.

There must of necessity be far greater danger of error in such a complicated system of calculation, requiring so many figures more than our own system.

If the metric system becomes compulsory in this country, we English manufacturers would have to face many difficulties and great expense in the internal arrangements of our mills and of our machinery.

We have in our beaming frames, measuring rollers which are generally 18 inches in circumference. This must be called 45.72 centimetres.

Our measuring roller in the tape frame which is 14.4 inches in circumference would become 36.55 centimetres.

The taking-up roller in the loom instead of being, say, 15 inches circumference, would become 33.1 centimetres, and the wheel required to give the pick must not be per quarter inch, but per centimetre.

All the loom widths would have to be altered from inches to centimetres.

All the reeds in use will be wrongly marked, as they are marked at present by the number of dents per inch.

The Uniform List of Prices for Weaving, which has cost so much time and labor to bring to its present more or less satisfactory position, would have to be altered. The list is based on reed space in inches, picks per quarter inch, lengths in yards of 36 inches, and counts of twist and weft as at present understood. This must all give way to centimeters, metres, and metre numberings, necessitating the revision and re-arrangements of the whole list, resulting in the direst confusion and leading to the gravest consequences owing to the confidence it would lose and the suspicion it would create in the minds of employers and employed.

If we adopt the metric system, the whole of our records showing how we have made our cloth in the past will be of no use for easy reference, as these records would all have to be converted to metric terms before we should be able to compare anything we might wish to make at the present time.

Again, all our literature, text-books, etc., on cotton weaving, would become obsolete, and therefore useless.

Why should we give up a system which has been in use in this country from time immemorial, and upon which we have built up a trade which I venture to assert is second to none? A system in which we have educated our customers in India, China, Japan, and the rest of the world wherever customers are to be found. If we were to change our system today, and at the same time found it impossible to persuade China, Japan and other large customers to change with us, what would be the resulting effect upon us? We should be compelled either to discard the metric system, or allow our trade to be taken from us by our friends in the United States of America, who are opposed to any change which will cause them to give up the English inch, yard or pound.

In conclusion, I have the authority of Mr. Henry Higson, the President of the Affiliated Associations of Cotton Cloth Manufacturers, representing over 300,000 looms, for stating that the consensus of opinion of that Association is against the metric system being introduced to the cotton weaving trade.

The next paper was by Monsieur F. Roy, from which the following extract is taken:

THE METRIC SYSTEM OF WEIGHTS AND MEASURES. BY F. ROY.

By a circular, dated 1st February, 1901, the Directors of the permanent Committee for a uniform system of numbering yarns pointed out to all the foreign members under what conditions the convocation of the diplomatic Conference, mentioned in the suggestions of the Congress, could take place:

"A diplomatic Conference must come to a preliminary understanding, and, in the present case, it is necessary, before this Conference can be summoned, that all the Governments taking part therein, shall in advance agree to introduce, in their respective countries, a uniform system of numbering yarns conjointly with other countries. The members of the Conference will assemble afterwards only for the purpose of studying how to put the reform into practice and of signing the diplomatic agreement."

In reply to this note, Herr Vogel (Germany) stated in the first place, that the German Government advocated the metrical system of numbering.

Herr de Pacher (Austria) announced that the Austrian Government would follow the example of Germany.

The replies from Italy, Spain and Switzerland were favorable.

However, shortly afterwards, we learned that a very strong opposition was about to be made to our plans by the Unions of Manufacturers in Germany, the latter wishing to remain free to introduce yarns numbered, wound and bundled in the English way, and the German Government de-

clared that it would not run counter to this manifestation.

This is a grave obstruction, for the Congress had recognized that it was not admissible for the Government to forbid the national spinners to number and make up their yarns otherwise than according to the metric system, while, on the other hand, permitting the introduction of foreign yarns numbered and made up in the English fashion.

All the efforts of the Committee, and particularly those of their German and Austrian members, were concentrated upon trying to persuade these industrial bodies not to maintain their veto.

The Committee were later on able to ascertain that this opposition arose in part from the discussion pending with respect to German customs tariffs. The manufacturers were then carrying on a campaign in order that the English system of counts should be maintained in the classifications of the custom-house tariffs, and this was because they feared that the spinning trade would profit by the transformation of English counts into metric numbering to obtain a modification of the categories to the detriment of manufacturers, i. e., of the weaving trade.

Not only were the efforts of the members of the Committee of no avail in inducing the German manufacturers to consent to the forbidding of the introduction of yarns numbered and bundled in any other way than by the metric system, but their efforts were equally vain when they sought to bring it about that the classification of the custom-house tariff for yarns should be metrical.

Finally, the Manufacturers' Unions did not go back on their decisions; they carried their point with their Government, and the Customs-tariff was promulgated with the English system of counts.

This double check in Germany impeded the work of the Permanent Committee, for it was impossible to do without Germany and Austria, the latter country having declared that it considered itself obliged to follow in the footsteps of Germany.

Under these conditions, it was no longer possible to hope to reach the end pointed out by the Congress until England and the United States adopted the metric system.

The reading of the papers was followed by a general discussion.

After adjournment the delegates were entertained at luncheon by the Liverpool Cotton Association, after which they were conveyed to Southport, where they were received by the Mayor and Mayoress and an afternoon tea provided. In the evening they were entertained at dinner by the Mayor and Corporation of Southport. The closing session was held in Manchester Town Hall on Friday and devoted to the reading of papers on cotton growing, from which we make the following extracts:

COTTON GROWING IN BRITISH COLONIES. BY J. ARTHUR HUTTON.

In introducing this most important question, it is hardly necessary to do more than allude to the unfortunate circumstances which have led to the establishment in England, France, Germany, and other European countries, of Cotton Growing Associations. The steady increase of demand during recent years, accompanied, as it has been, by no corresponding increase in supply, resulted in a climax in 1904, when many of the cotton mills of the world had to run short time or stop entirely. The situation has for the moment been relieved by the wonderful crop produced in the United States last season; but we all recognize that should the weather conditions in America be as unfavorable this year as they were in 1903, the crop may be little more than 10,000,000 bales, and we shall again have a recurrence of speculation, with disastrous results for every user of cotton. The large accumulation of capital in the hands of a few individuals gives the speculator an immense power in dealing with the supplies of raw material, and, if the cotton industry of Europe is to maintain its position, it is absolutely essential that new sources of supply should be developed as soon as possible. What America is aiming at today is to reduce the production of cotton, so as to keep the price high. What we want are large supplies of cheap cotton.

It is also extremely doubtful whether the United States can produce increasing quantities sufficient to meet the natural increase in the demand for cotton. The population of the world increases annually, and needs at least 400,000 bales more every year to meet their requirements. This means that each year an additional million acres must be placed under cotton, and the question naturally arises: Can those additional acres be found in America, apart altogether from the question as to whether they have a sufficient supply of labor efficiently to cultivate a largely increased acreage? Putting the present consumption of American cotton at 11,500,000 bales, we find, reckoning the average production at 203 pounds per acre, that it requires at least 28,000,000 acres to produce this cotton. In five years from now we shall therefore require 33,000,000 acres, and in ten years 38,000,000 acres under cotton to fill the world's requirements. It has been estimated by Mr. Henry G. Kittredge that 35,000,000 acres is the limitation of the amount of land which the Southern States can economically give to this one agricultural product. If this estimate be correct, and assuming America has the necessary labor for its effective cultivation, in seven years from now the maximum production of the United States will have been reached. If, therefore, in the meantime Europe has not provided herself with other sources of supply, we shall then see the cotton trade develop into a struggle for supplies of the raw material, and we shall meet with a period of speculation and gambling which may result in the partial ruin of the cotton industry of Europe. In this matter there can be no question of international jealousy, for our interests are identical, and it is therefore necessary for us to help one another in promoting the object we all have at heart—namely, the establishment of new sources of supply—with the additional advantage of thereby developing many new markets, which would cause largely increased demands for European manufactures.

To sum up the results of the work of the British Cotton Growing Association in a few words, it is not too much to say that they have practically

proved that the British Empire is able to produce a vast amount of cotton and of every quality necessary for the needs of the world. This result is due in the first place to the untiring and unselfish way in which the members of the Council have devoted their valuable time to the work of management; in the second place to the hearty and willing co-operation of the Colonial Office and of the Government officials; and lastly to the generous financial support received, not only from the spinners and manufacturers, but also from the operatives. Lancashire may well feel proud of the public spirit of her working classes, who have subscribed large sums of money in support of this great movement at a time when they were suffering severe losses and actual privations owing to the mills running short time. Probably no movement has ever received such general support from all classes of the community.

I should also like, on behalf of the British Cotton Growing Association, to express our great satisfaction that several European countries have also recognized the vast importance of this question, and are carrying on similar work to our own. It is also a pleasure to recognize the progress that they have been making, and a still greater pleasure to call public attention to the cordial relations which exist between their Associations and ours. We all now recognize that it is the duty of the manufacturing nations of Europe heartily to cooperate together in establishing new cotton fields, so as to ensure the one great essential for the prosperity of their trade—ample supplies of the raw material at reasonable prices.

REPORT ON THE CULTIVATION OF COTTON.

BY C. BERGER.

The enormous development of the cotton industries which has taken place during the last fifteen years in England and on the whole of the continent, and which was coincident with the creation of numerous establishments in the United States of America, has certainly been the cause of the incessant and important fluctuations in the raw material which have been observed during these last seasons.

American speculation, powerfully assisted by the capital placed at its disposal, has specially turned its attention in latter years towards raw cotton, bearing well in mind that all the industries on the continent working with cotton could only subsist by drawing their supplies from America, as India and Egypt only supply very small quantities to European spindles, and the cotton from these sources is not in general use.

Thus, being masters of the situation, while considering in no way the prosperity or non-prosperity of the trade in general speculators have raised or lowered prices at their will, and today we are at the mercy of the American jobbers.

This season, the forecasts of the crop describe it as being one of the most important ever known. 13,500,000 bales, perhaps 14,000,000; everything, therefore, would point to an inevitable drop in price.

In spite of this supply, which allows of the feeding of all the spindles in the whole world, the Americans, feeling themselves masters of the article, have been able by their arrangements to keep the cotton back for several months, and have only parted with it in small quantities, keeping rates up at limits which leave them a very considerable profit.

This is a new demonstration of the power of American speculation, and the perfect understanding existing between producers and holders of an article which both know to be indispensable to all cotton industries. This exceptional holding-up of the prices of the American cotton has helped the Indians and Egyptians to maintain, on their side, prices which interfere considerably with the working of the spindles using these two kinds of cotton.

The American spinners are passing through the same crisis as the spinners of the Old World, but they feel today that they can look forward to a better future.

Backed up by their Government, American spinners and manufacturers have but one end in view, the development of spindles and looms in order to reach a given moment, still distant, but fatally sure, when they will be able to export no longer cotton in bales, but in woven goods in all the different ways required by the consumers of the entire world.

Confronted by this very grave situation, England and all the countries of the continent possessing colonies which offer the conditions needed for the cultivation of cotton, came to the conclusion that it was necessary to take steps which should render them henceforth independent of one single producer of indispensable raw material.

Each set to work, and at the present time we find ourselves face to face with Colonial Cotton Associations, formed in England, Germany, Italy, Belgium, Portugal, Spain, and France; interesting trials in the way of cotton-growing are even spoken of as being made in South America, and, above all, in the Argentine Republic.

The various Associations with which my report will, later on, deal separately from the point of view of progress made and results achieved, have almost passed beyond the stage of studies, and are entering into the real period of commercial activity.

It may be said that everywhere rapid strides have been made, and that the results obtained prove the great vitality of these enterprises, when it is borne in mind that it has been necessary to develop this cultivation in the midst of a race generally disinclined to work, to prove to this race what resources they would annually derive from the growth of cotton, to furnish the latter with seed calculated to produce the best quality, to organize little by little centres for purchasing, ginning, pressing, packing, and, above all, to endeavor to secure reasonable rates of transport, which is the most difficult task to perform.

Everything is really going on in the right way, and we may venture to hope that a few years hence the crop of cotton will be sufficiently large to compete with America, and to oblige that country to keep its prices within more reasonable limits.

In each country the Government should lend its support financially to the Colonial Cotton Associations, and, by special measures, favor those persons who are engaged in the cultivation of cotton.

Most assuredly the Old World will have to take protective measures against the invasion of the products of the New World. For the moment, do not let us dwell too much on the future, let us

occupy ourselves especially with the present, leaving all care of the struggle to our successors in the cotton trade.

Permit me now, after this perhaps somewhat pessimistic digression, to post you up as to the present situation of each of the Colonial Cotton Associations.

Russia.—I have little to say to you about Russia, which first of all thought of developing the cultivation of cotton in the province of Turkestan, and succeeded in causing it to produce, after fourteen years, sufficient quantity for one-third of its consumption.

Russia will continue this work, which has been so well begun, as soon as she has recovered from the terrible trial she is now passing through, and which, today, deprives us of the presence of her Delegate to the International Committee.

Belgium.—Belgium possesses an immense field of experience with Belgian Congo, representing a tract of land five times larger than that of France. At this moment she is making trials to some extent everywhere over this vast territory, but we may even now say that the cultivation of cotton will be localized in the country to the southwest, near the sea, and situated to the north of Angola, a Portuguese possession, thus avoiding carriage, which would always be laborious and costly, in spite of the facilities offered by navigation on the Congo, especially when a railway gets into working order, which will be constructed through a region where the Congo is no longer navigable.

The trials of growing cotton on the Congo are being made by Americans who have come from Texas and are well acquainted with cotton. The native, taking little interest in it and disinclined to labor, will only work under the direction of whites; when the whites have gone away, he returns to his primitive lazy habits, and is once more a warrior and even a cannibal. American seed appears very likely to thrive and produce a satisfactory quality.

Italy.—Italy is making trials in cotton growing in Erythrea only, the soil of which seems favorable to the production of varieties resembling that of Jumel. The cotton obtained today appears of good quality and, as it is still the subject of study, the products gathered are carried to Italy after undergoing the process of ginning in Egypt, that is, halfway between the country of production and the country of consumption. When cotton grown in Erythrea is produced in sufficient quantity, the Italian Colonial Cotton Association will discuss the laying down of special plant for ginning and packing.

Spain.—Cotton is cultivated in no Spanish colony. Efforts have been made to grow it in some parts of the south of Spain and in the Balearic Isles, where in former times it gave satisfactory results. It was abandoned because the cultivation of this plant was unremunerative. The quality obtained was at the very least as good as the Egyptian.

In recent times, on account of the rise in cotton, they have tried in these same parts, to return to the cultivation of this same textile. The Spanish Government endeavored to encourage this movement by means of a Bill passed by the Chamber in 1904, by which exemption from taxation is granted for three years on lands intended for growth of cotton, and a distribution of prizes is made in cash to the amount of 60,000 pesetas for the first year, 100,000 pesetas for the second year, and, lastly, 250,000 pesetas for the third year, to the growers who produce it in the greatest quantity.

These prizes are awarded by a jury composed of the presidents of the Superior Council of Agriculture of the Agronomic Consultative Association, and of the Committee of National Work. Notwithstanding these great inducements, it does not seem that the cultivation of cotton on a great scale is developing, principally because its yield is unremunerative. From the trials recently made in Andalusia it has been seen that the net cost is more than 10 pesetas per 100 kilogrammes.

Portugal.—The Portuguese Government appointed in the month of August, 1904, a special commission for the purpose of studying and proposing means to develop the cultivation of cotton. This commission, presided over by the governor of the province of Angola, was composed of honorary ministers of State, the general director of the Administration of Colonies, and the representatives of the Associations of Industry, Commerce, Agriculture, of the Colonies and of the Continent. The work of the commission was terminated in the month of March, 1905, when they presented to the Ministry of the Colonies a report giving a recital of the facts connected with the cultivation of cotton in the Portuguese Colonies, and proposing a Bill, which the Minister adopted, with a view to laying the same before Parliament. This Bill consists of the following points:—

1. To quote on the exchanges of Lisbon and Oporto colonial cotton by means of the municipal associations, who would engage to buy all cotton grown at the price quoted, in accord with the Exchanges of foreign countries, England, Germany and France.

2. Exemption from all land taxes in Africa, and from exportation and entrance duties on the continent, which represents a profit of ten centimes per kilogram in relation to the importation of foreign cottons, and exemption of entrance duties for all machines intended for the cultivation of cotton.

3. Selection of seed, and distribution in the cotton stations established in the regions most favorable to the growth of cotton.

4. Reduction of the tariffs of railroads and freights by the boats of the National Company, and an early opening of all the necessary routes of communication.

The Bill will be brought forward for discussion in the present session of Parliament, and every hope is entertained that afterwards a special Association will be organized in order to promote the fullest development needed in the cultivation of cotton, profiting by the concession obtained from the Portuguese Government.

The cultivation of cotton is already beginning to assume some importance, and interests deeply the Colonial Companies and the natives.

The importations of cotton from Angola, which were 17,000 kilogrammes in 1903, rose to 107,000 kilogrammes in 1904. In 1905 larger quantities are counted upon, coming from the west coast and also from the east coast, where very considerable plantations have been made by the Com-

pany of Mozambique and other colonial societies.

The qualities obtained are fine and certainly superior to the American quality "good middling." In the province of Angola, as in Mozambique, there are territories large enough to produce a quantity of cotton sufficient for the entire consumption of the world, and the conditions of cultivation are of the most favorable kind.

Germany.—The German Association, known under the name of "Kolonial-Wirtschaftliches Komitee," has begun with a sum of 937,000 francs. It also receives annually, both from the imperial government and from the government of Togo and West Africa, 75,000 francs, an amount which will certainly be increased this season. The production of cotton is progressing, and the quality appears to give satisfaction to those who have used this raw material. The places where cotton is produced in the German colonies offer an advantage as regards carriage to the centres of consumption. I am short of the necessary information to give you an idea of the quantities produced at the present day and those expected this year.

France.—In 1903, we occupied ourselves with prospecting; in 1904, we made a selection based on the results obtained and on the fresh information we have been able to gather concerning certain regions respecting which, at the beginning, we felt some hesitation as regards their suitability as a cotton-field. Our efforts were more particularly directed to the Soudan, Dahomey, Madagascar, and the region of Oran in Algeria.

Soudan.—In the Soudan, the Association considered that prudence and reason counseled that they should not split up their forces, and decided to concentrate their action in the region of Segou, which was favorable, both on account of the numerous native plantations to be found there, and through its relative proximity (170 kilometres) to Koulikoro, on the Niger, the head of the railway line which ends at Kayes, on the Senegal.

In 1904, the natives were in general quite disposed to continue the efforts made the previous year, for they had recognized the superior quality of cotton produced from the American seeds. Five tons of this seed were sent in May, 1904, and distributed for the greater part in several villages in the districts of Segou.

The natives cultivated carefully, and willingly followed the advice given them, and relying on a return for their work, they showed themselves eager to sow the exotic seed. The cotton season of 1904-1905 commenced under fairly good auspices, the raising of seed was carried on regularly, the vegetation showed itself vigorous.

In the month of January last, a letter brought us less good news as regards the plantations; the cotton trees had suffered much from the drought caused by an east wind which damaged a great part of the crops in the Soudanese region. It is to be noticed that the native cotton plants of two years' growth suffered least, because their roots had been able to reach a cool subsoil. In a like manner the cotton trees produced by our American seed sown in June, 1904, that is to say in the same year, were less affected than the native cotton plants of the same age.

I must point out that the drought was almost general in West Africa, and that the news we have received from all sides allows us to state that our Colonial Cotton Association has not been the only one to suffer thereby. This is but a slight consolation, yet this incident leads us to think it will, perhaps, be necessary, in certain districts, to make use of irrigation in future, in order not to see the crops exposed to almost complete destruction in case of a severe and irregular cold season.

Dahomey.—Our action in this colony is of too recent a date to allow us to form any opinion. The Colonial Cotton Association caused exotic seed to be distributed, but in this country also rain did not fall in sufficient abundance, and came too late. The drought, fortunately, does not appear to have done damage to the same extent as in the Soudan.

Madagascar.—The trials undertaken in 1903, with various varieties of seed, have proved that the great island could furnish abundantly, principally on the west coast, remarkable products both in respect of length and fineness of their fibre. In November, distribution of seed will be made to the inhabitants of the western districts, and of the province of Betsileo.

Algeria.—Two hundred kilogrammes of Egyptian seed have been distributed by the Association to colonists settled on the plains of Sigg. de Perregaux and de Relizane. The different cottons obtained are of quite remarkable qualities, and met with great appreciation in the market of Havre.

The French government lends its aid to the development of cotton growing in its various colonies, carrying out works necessary in the construction of the means of communication, which in two or three years' time will allow of the cotton being brought to the French ports at prices equal to those paid from New Orleans or Galveston.

The natives of Soudan and Dahomey seem to take very kindly to the new cultivation, which, after much thought, was recommended to them. They are pleased to receive money in exchange for their cotton, and are satisfied with the qualities obtained from American seed; they recognize so well the difference of quality that, at the time of the last crop, they kept for themselves the cotton obtained from American seed, and wanted to deliver to us the cotton gathered from their native cotton trees.

The qualities obtained in the Soudan, Dahomey, Madagascar, and also in Algeria, are of very good staple and have been very well manipulated, as may be seen from the specimens which we submit for your appreciation.

PORTUGAL AND INTERNATIONAL COTTON GROWING. BY SR. AUGUSTO RIBEIRO.

A Commission was charged, on August 8th, 1904, to study the question of cotton growing. This Commission remembered, first of all, the capacities of the Portuguese colonies for the cultivation of the cotton plant, and the duty of interesting Portugal in the international work of the augmentation of the raw material so necessary for a huge European industry.

The Commission concluded its labors on the 17th of March, 1905, and presented to His Excellency M. Moreira, Jun., the Minister of the Marine and Colonies, a detailed report, the result of a profound study of the question. The report was inspired by patriotic sentiments, and expressed a strong belief

in the future of the cultivation of cotton in the colonies of Portugal with the co-operation of the government. It also pointed out the possibilities for individual and collective initiative, and the aid which could be rendered by the native element.

The report found that the first legislative measures had included all the necessary elements to enable the government to determine any action for the cultivation of cotton in these over-sea domains; measures which, initially dating from 1852, were renewed several times up to 1865, in the hope that the system might be brought to a pitch of perfection.

One of the best parts of this work is the report of the Colonial Council of 1861, which, justifying the royal decree of December 4th of the same year, granted facilities for the obtaining of plots of ground destined for the cultivation of cotton, and authorized the government to import a quantity of chosen seed, in view of distributing such gratuitously to the agriculturist. Further, it demanded the purchase of gins and other necessary machinery, the free import and export of cotton, and, indeed, all material (machines, building materials, agricultural implements, means of transport, and seed) of which need would be found. Three prizes of 50.000 francs (£2,000) to be distributed each year during ten years to growers having the finest cotton plantations was also suggested.

The Commission, approving of the results obtained by the foreign initiative, also found that the capability of the Portuguese colonies advantageously to contribute to the extension of the cotton growing areas was great. It affirms that the assistance of the government would be sufficient to assure to the Portuguese industry all the raw material which it would have need of. The government would serve principally to give value to the products of native labor, as the energy of the native laborer would rest upon the amount of value placed upon his work. By this he would know the quality and prices of the cotton sent by him to the market. It is to be hoped that the assistance of the officials and the missionaries will be given to that essentially patriotic work. It is necessary to inspire confidence in the native. That is the best way to gain their devotion and friendship, and the one mostly advised by colonial writers. Such a way cannot be legislative, as its influence is moral, and depends upon the character of the men and the spirit of the institutions. It is for those who hold the reins of government to inspire by example.

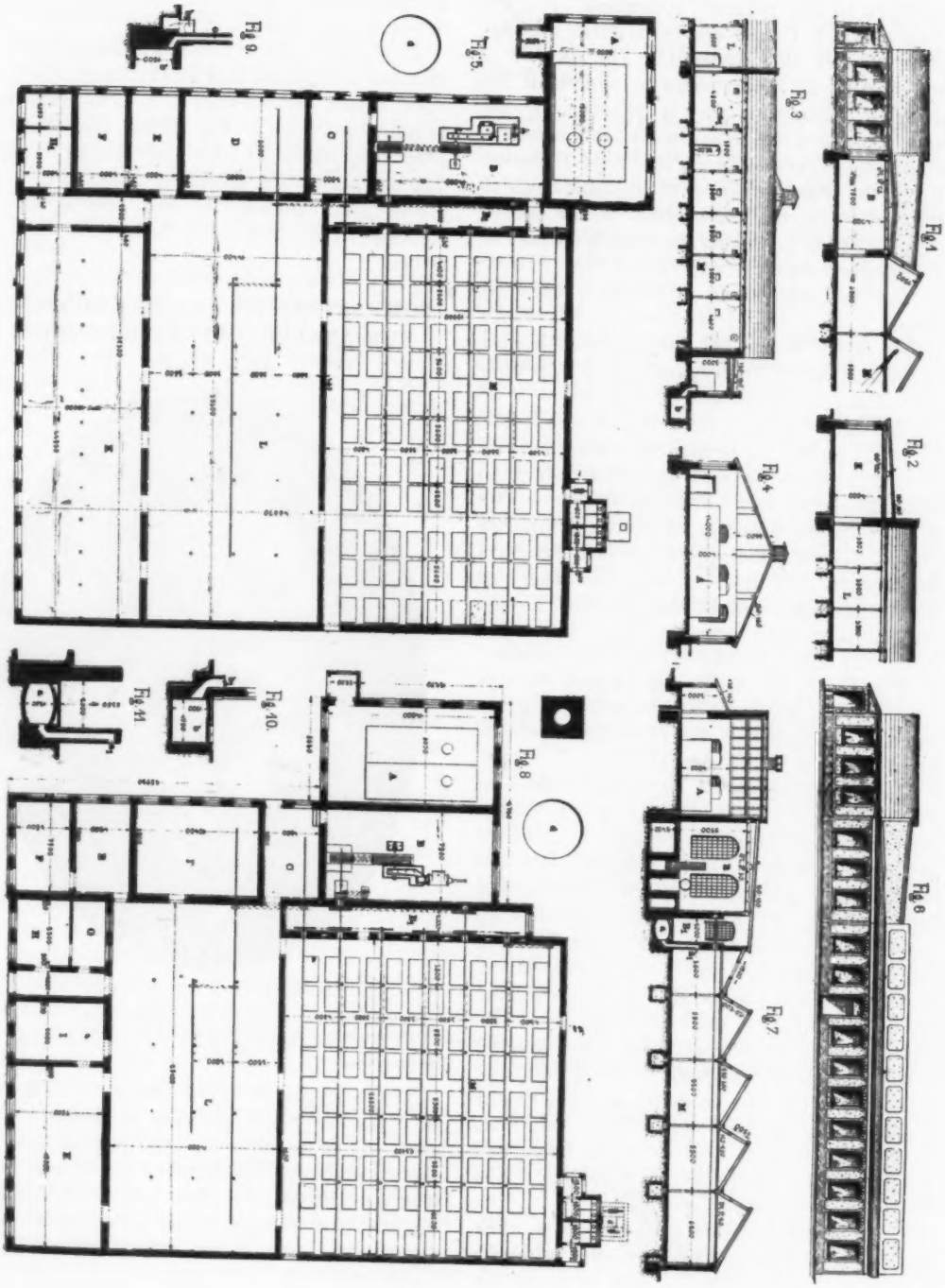
It is hoped that the government will give eventually, and for a reasonable time, the freedom to allow the cotton to remain at the custom houses, in order to avoid the sale of stock at a low price.

After these papers had been read it was resolved that the next meeting should be held in Germany, the place to be selected later. The Congress then adjourned, after what was unquestionably a very successful meeting. By no means the least benefit of such meeting is the personal intercourse between people ordinarily separated by great distances from each other and thus prone to misunderstanding. I cannot close this brief account of the second meeting of this Cotton Congress without again referring to the very friendly reception given to the American delegate by all the delegates and in fact by all the people with whom he came in contact. Unfortunately he was not present on the first day when the Manchester Docks were visited, but on Friday the Manchester Ship Canal Company placed their launch at his disposal and he thus had an even better opportunity to inspect the docks and see the condition of American cotton than if he had been in the large party on Monday.

A FANCY GOODS WEAVING MILL

The accompanying plans of a weaving mill for fancy goods were prepared for L. Popper & Sons, Neubistritz, Austria, and include two ground plans, Figs. 5 and 8, each of which possesses special advantages. The principal difference between the two is found in the arrangement of the rooms adjacent to the main weaving room. In Fig. 5 the main entrance is at the front and leads through the hallway to the preparing room, L. At the left of this hall is the office, H', part of which at the extreme left is used for the manager's office. At the opposite side of the hall is the storeroom, K, which is connected with the preparing room, L, by five wide doors. The objection to this arrangement is that all the woven goods must be carried across the preparing room, which is 47 feet wide. It offers the advantage, however, of permitting the main building to be extended lengthways. In the weave room, N, are 110 looms, arranged in 11 rows of 10 looms each and divided into six sections by as many alleys. Posts divide the room lengthways into six bays as follows: 13 feet; 18 feet (3); 20 feet; 18 feet; total 105 feet. Crossways it is divided into five bays: 14 feet; 11 feet, 8 inches (3); 14 feet; total 63 feet. The area of the room is 6,925 square feet, equal to 63 square feet per loom.

Adjoining the preparing room are the finishing, sizing and drying rooms, D, E, F. Next to the finishing room, D, and between the preparing and weave rooms is a small repair shop, C. Next to the repair shop is an engine room, B, containing a high pressure



A FANCY GOODS WEAVING MILL.

steam engine arranged so that it can be changed to low pressure if desired. The engine is 80 H. P. and serves to drive the machinery and the dynamo. The power is transmitted by hemp ropes as shown in the drawing. The rope way is between the engine room and the weave room; this arrangement effects economy in the rope required. From the main fly wheel these cables run to the pulley on the main shaft of the weave room. From this shaft the counter shafts in the weave room are driven by ropes; those in the preparing and finishing rooms by belts.

The boiler house, A, contains two boilers of suitable size. The engine room, B, is connected directly with the weave room.

The second ground plan, Fig. 8, shows the weaving room, N, preparing room, L, belt way, B′, engine room, B, and repair shop, C, in relatively the same order as shown at Fig. 5. The looms, however, are more compactly placed. Posts divide the room into five bays lengthways as follows: 12 feet, 4 inches; 18 feet (3); 20 feet; total 86 feet, 4 inches. Crossways it is divided into six bays: 14 feet, 2 inches; 11 feet, 4 inches (4); 15 feet, 6 inches; total 75 feet. The area of the weave room is 6,561 square feet, and with 108 looms gives about 60 square feet for each loom—somewhat less than in the plan at Fig. 5.

The arrangement of the other rooms at Fig. 8 is better than at Fig. 5. K is the storeroom and measuring room; I, the napper room. Next to this is a hallway, on the left of which are the offices, H, and the tool room, G, lighted by two windows looking into the preparing room. D is the finishing room, E the sizing room, F the drying room. The boiler house is parallel with the engine room and of the same dimensions. The weaving and preparing rooms are covered with a saw-tooth roof built of wood and iron. The windows in the roof run at right angles to the shafts of the looms. The roof rests on cast iron posts and on these also rest wooden beams, 5 inches by 8 inches. The height of the windows is 5 feet.

Fig. 2 shows the covering of the roof. The roof of the engine and boiler rooms is clearly shown at Fig. 7. Figs. 9 and 10 show the construction of the closets; Fig. 11 shows an air passage (a) under the belt way, also an air passage, A′, by which fresh air is carried to the weave room.

By comparing the two plans it will be seen that the measuring and storerooms at Fig. 4 have nearly four times the area that the same rooms have at Fig. 8, and also that the preparing rooms at Fig. 5 are larger. Various elevations are shown at Figs. 1, 2, 3, 4, 6 and 7.—Translated by the Textile World Record from Uhland's Technische Rundschau.

COMPARISON OF THE METHODS FOR THE ANALYSIS OF WOOL, COTTON AND SILK.

BY JOSEPH COLLINGWOOD.

Winner of the Textile World Record Gold Medal for General Excellence in Dyeing and Chemistry at the Philadelphia Textile School, 1904. The following thesis was written in competition for the medal.

The analysis of wool, cotton and silk has held the attention of many chemists in the past. It is an important subject because of the assistance the manufacturer derives from it in ascertaining the character and determining the percentages of the constituents of a composite fabric being manufactured by a competitor.

The incompleteness of the methods that

have been used, and are still being used, spurred many noted chemists to aim at their improvement and perfection.

Reviewing the work of these investigators, it seems to have been difficult to obtain results that were consistent with each other, and with the results obtained by analyses according to the ordinary known methods.

This kind of analysis has been taken up and experimented with most by men who had become expert in the general analysis of textile materials.

Foremost among these men might be mentioned the following: Richardson, Persoz, Hoehnel and Matthews.

These men realized how incomplete, unsatisfactory and more or less inaccurate were the methods then employed for the separation of wool, cotton and silk fabrics by chemical means. On realizing these defects, they instituted research and endeavored by numerous experiments to discover methods that would stand the test for all conditions liable to be encountered in the analysis of a complicated fabric composed of these three different fibres, or at least two of them.

There are many methods that have been advanced as the best. But all of these have been found to be lacking in some particular, rendering inaccurate the whole analysis. Each one who has experimented along these lines claims to have obtained better results by the use of some reagent or special method than his predecessors. Another using the same method, from some cause or other, may not obtain as satisfactory results, and therefore condemns this method as unable to meet the conditions required.

The primary thing to consider here, as in any analysis, is to know thoroughly the characteristics and properties of the constituents composing the fabric to be analyzed. These three fibres differ materially in themselves, as well as in their properties.

Wool and silk are both animal fibres, while cotton is a vegetable fibre. The wool and silk fibres, however, differ from each other in their formation and properties, especially their chemical properties, which interest us most in this case.

The wool fibre is more sensitive to alkalies than silk, while it is not nearly so sensitive to dilute and concentrated acids. The cotton fibre, however, is very sensitive to acids, being tendered by dilute acid solutions, while alkalies do not have any great deteriorating effect upon it.

REMOVING SILK FROM COTTON AND WOOL.

The two methods in favor a few years ago were, first, the dissolving of the silk by a solution of ammoniacal nickel oxide, and second, by a solution of basic zinc chloride. The former method was advanced by F. W. Richardson and the latter by Persoz. (See Jour. Chem. Ind., vol. 12, pp. 430.)

Richardson found the ammoniacal nickel oxide worked very well in the cold for dissolving the silk in simple mixtures or fabrics, the length of time of the treatment required being two minutes. For more complex fabrics, such as plush, heat had to be applied. The treatment in this case required about eight minutes. In both instances the wool lost about .33 per cent. and the cotton about .45 per cent. Hence this method is a very satisfactory one, although not much used.

Persoz invented the method for dissolving the silk in basic zinc chloride. To do this he treated a piece of goods, which had had all finishing materials removed in the usual manner, with a solution of basic zinc chloride of 1.72 specific gravity for two minutes at the boiling point. At the end of that time he washed the residue with dilute hydrochloric acid and then with water. To remove the wool from the cotton he boiled the residue from the treatment with basic zinc chloride in a solution of caustic soda of 1.02 sp. gr. for fifteen minutes. Persoz, however, did not obtain very good results because he used air-dried material and failed to note that the basic zinc chloride, while attacking the silk, would also attack the wool, thus boiling too long in the solution.

Matthews had had considerable success in removing the silk in a mixed wool and silk fabric by treating with boiling hydrochloric acid. (See Textile Fibres, by Matthews, pp. 251.) After he had removed all the finishing materials by treatment with dilute hydrochloric acid and sodium carbonate, he dissolved the silk by boiling in concentrated

hydrochloric acid for two minutes. This treatment is far too severe upon the wool, which suffers a material loss, but is eminently adapted to the separation of silk from cotton if proper precaution be taken to remove all trace of acid from the residual cotton before drying it.

In any analysis of two of the fibres, or all three together, their quantitative estimation is determined by the loss in weight occasioned by the removal of one of the constituents. This separation is brought about and is based upon the fact that this constituent is soluble in a certain reagent. The most important factor in this treatment is that the other fibres present are not affected or dissolved to any considerable extent.

In the experimental work, which has been carried oue with precision and careful attention to minute details, the following solutions were used for the separations:

(1) A 5 per cent. solution of caustic potash. This solution is very readily made up.

(2) A 20 per cent. sulfuric acid solution.

(3) The ammoniacal copper oxide solution.

(4) The ammoniacal nickel oxide solution. These latter are not very readily made up, and their strength, owing to their instability, is likely to vary. It is difficult, therefore, to prepare solutions of the same strength and having the same effective power for succeeding series of determinations.

(5) A basic zinc chloride solution.

To make the ammoniacal copper oxide solution, 25 grams of crystallized copper sulphate were dissolved in about 250 cubic centimeters of distilled water, and caustic soda solution added until precipitation was complete. Excess of caustic soda was carefully neutralized, then a large amount of water was added and the mixture stirred. After allowing it to settle the clear liquor was poured off and the precipitated copper hydrate was collected on a filter. When washed free from all foreign matter the precipitate was transferred to a beaker and dissolved in ammonia water, one part ammonia to one part water. Any undissolved copper oxide was filtered off, leaving a clear dark blue solution of about .97 sp. gr.

The copper hydrate must be freshly precipitated from a cold solution, and must not be black in color, or else it will not readily dissolve in the ammonia water.

The ammoniacal nickel oxide was prepared similarly to the foregoing ammoniacal copper oxide. The color of the solution was blue, but not so dark a blue, and the sp. gr. was .95.

The basic zinc chloride solution was made by dissolving 500 grams of zinc chloride in 425 cubic centimeters of water, and adding 20 grams of zinc oxide. Heat was then applied until complete solution is effected.

Before being separated by the special methods all the fibres were previously conditioned, i. e., the amount of water present in the fibre, as hygroscopic moisture, or water absorbed from the air, was determined. This process was carried out by heating a weighed amount of air-dried material in an air oven at a temperature of from 100 to 105 degrees C. until, on allowing the material to cool in a dessicator, no further loss in weight was noticed, or a constant weight was obtained. This loss in weight corresponds to hygroscopic moisture; the weight of residual fibre is termed "bone-dry" fibre.

The reason that bone-dry, or conditioned fibre, was used in these experiments, is because the length of time over which they extended was so great that air-dried material could not be used and obtain results which were anywhere near correct, the air-dried weight varying with the weather.

The next step was the removal of all finishing materials, such as sizes, fillers and mordants, if any were used. This was carried out as follows: The weighed fibre was boiled in a one per cent. solution of hydrochloric acid for ten minutes, washed well and then treated for ten minutes with a one-twentieth per cent. solution of soda ash at the boiling point. When thoroughly washed it was dried at 100 to 110 degrees C. as before and weighed. The loss in weight corresponds to the weight of finishing materials. The wool and silk fibres each lost about three per cent. of finishing materials, while the cotton fibre only lost about two per cent. Stronger solutions of hydrochloric acid and soda ash are found to have greater action on the fibres, while they do not remove the finishing materials more efficiently.

(To be continued.)

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE DESIGN SCHOOL.

LESSON XIV. POINTED TWILLS.

This subdivision of our twills forms a most extensively used system of weaves in the manufacture of all kinds of cotton fabrics, being also used to a considerable extent in connection with union (cotton warp and worsted filling) and all worsted dress goods, as well as in the silk trade or any variety of fabrics, whereas only a few of the smaller weaves find use in the manufacture of woolen or worsted fabrics for men's wear, in the latter instance chiefly on account of their adaptility for special color effects, such as hairlines, etc. Similar to the broken twills and skip twill previously explained, pointed twill can be subdivided into such as,

1st, pointed warp ways,
2nd, " filling ways, and
3rd, " warp and filling ways.

To explain the construction of a few standard weaves of these three subdivisions of pointed twills, and at the same time thus explain how to construct an endless variety of similar weaves, shall be the object of the present lesson.

POINTED TWILLS.—POINTED WARP WAYS.

The rule for constructing these weaves is thus: Run your foundation 45° twill for a certain number of warp threads in one direction, and in turn reverse the direction of drafting, using the last warp thread of the one direction of drafting as the first warp thread of the reverse direction, said warp threads thus claimed by either direction of drafting thus forming the characteristic "points" in the effect of the weave, and which feature gave to the weave their name, pointed twills. This feature of this system of weaves will indicate that in order to calculate as to repeat of a certain drafting, said "point threads" are only to be considered once, by what we mean that, for example:

Drafting 8 ends from left to right, and 8 ends from right to left (better quoted thus 8/ 8\)= 8+8=16—2 ("points" in repeat of weave necessary)=14, Answer, i. e. the weave repeats on 14 warp threads. Again, 5/ 5\=10—2=8, Answer, repeat of weave.

With reference to repeat of weave filling ways, the original repeat of the ground weave remains undisturbed.

Of the plates of weaves accompanying this article, Fig. 1 shows one of the most simple kinds of pointed twills, having for its foundation the $\frac{1}{3}$ 3 harness twill drafted thus: 3/ 3\=3+ 3=6—2=4×3, repeat of weave. ⊡ type below weave shows the drafting from one repeat.

Fig. 2 shows the mate, i. e. warp effect, to weave Fig. 1, the foundation in this instance being the $\frac{2}{1}$ 3 harness twill, warp effect. ⊡ type below the weave shows again one repeat of the draft, i. e. draw 3 ends from left to right ×3 ends from right to left, and claiming the "point" for either direction of drafting. Repeat of weave 3+3=6—2(points)=4 warp threads × 4 picks. This weave is extensively used in the manufacture of woolen and worsted, as well as union and cotton trouserings, on account of its adaptility for nice hairline effect.

In order to show this last mentioned item more plainly to the student diagram 3 is given, showing this weave (see ⊡ type) arranged for a color combination, thus:

Warp: 1 end light (see □ type) to alternate with 1 end dark (see ⊠ type).

Filling: 2 picks dark (see ⊠ type) to alternate with 1 pick light (see □ type).

Below the weave is given the color effect (hairline) as produced by means of weave and color arrangement of warp and filling quoted before.

Fig. 4 shows us a three color hairline effect produced by means of the pointed twill obtained from the $\frac{2}{1}$ 3 harness 45° twill (see ⊡ type) thus:

4 ends—left to right
<—point

4 ends—right to left
<—point
3 ends—left to right
<—point
3 ends—right to left
<—point
and repeat over.

—

14 ends drafted less
4 points=

—

10 warp threads×3 picks in repeat of pattern.

Arrangement of warp is:

1 end medium (see ⊡ type)
1 end light (see □ type)
1 end dark (see ⊠ type)
1 end medium
1 end dark
1 end light
1 end medium
1 end light
1 end dark
1 end light

—

10 ends in repeat of dressing

Arrangement of filling to be

1 pick medium
1 pick dark
1 pick light

—

3 picks in repeat of the color arrangement.

Below the weave the color effect produced is shown. Having thus given a fair idea as to the practical use of these (more simpler) pointed twills in connection with woolen or worsted men's wear fabrics, we will now return to the construction of pointed twills, and when in connection with weave Fig. 5 we meet with the pointed twill obtained from the $\frac{1}{2}$ 3 harness twill by drafting the latter alternately for 5 ends in one direction, and then for 5 ends in the other direction, repeat of weave (5+5=10—2=) 8×3.

Weave Fig. 6 shows the warp effect of weave

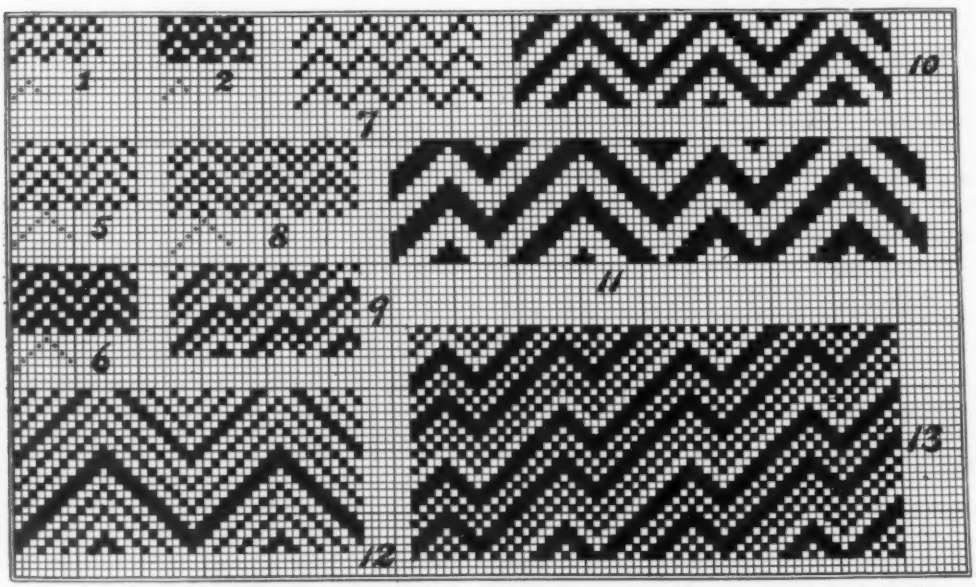


Fig. 5, being obtained by a corresponding drafting from the $\frac{2}{1}$ 3 harness twill.

Below weaves Figs. 5 and 6 we show by means of ⊡ type the method of drafting these weaves, being at the same time also the drawing in draft necessary for producing these weaves, if for one reason or the other, only 5 harness would be at our disposal. However, we must remember that provided if necessary, 3 harness (the lowest number of harnesses possible to use) will be sufficient to produce these pointed twills in the loom, the draft in this instance being: *1*, 2, 3, 1, *2*, 1, 3, 2.

Weave Fig. 7 has for its foundation the $\frac{1}{3}$ 4 harness broken twill obtained by means of alter-

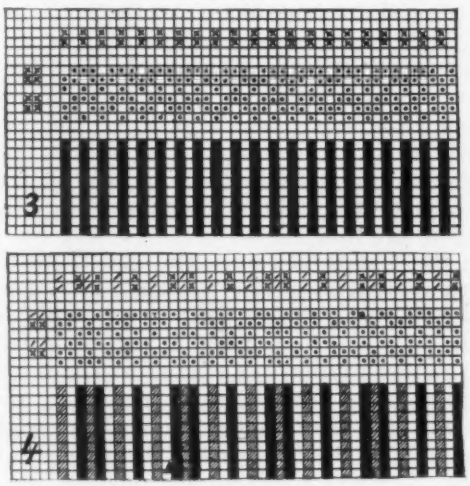
nately drafting four ends one way and then reverse, hence repeat of pointed twill (4+4=8—2=) 6 warp threads ×4 picks.

Weave Fig. 8 has for its foundation the $^{1}_{1}{}^{1}_{2}$ 5 harness twill, drafted 5 ends left to right, and 5 ends right to left; repeat (5+5=10—2=) 8×5.

Weave Fig. 9 has for its foundation the $^{2}_{2}{}^{1}_{1}$ 6 harness twill, drafted thus:

7 ends left to right
3 ends right to left
} ×3, i. e. until

(7+3=10—2=8×3=) repeat 24×6 is obtained. The drawing in draft of this weave—if required to be executed on 6 harness—is thus:



1, 2, 3, 4, 5, 6, 1, 6, 5, 6, 1, 2, 3, 4, 5, 4, 3, 4, 5, 6, 1, 2, 3, 2.

Weave Fig. 10 has for its foundation the $^{2}_{3}$ 6 harness 45° twill drafted thus:

10 ends left to right
8 ends right to left
} ×3, i. e. until

(10+8=18—2=16×3=) repeat 48×6 is obtained.

Weave Fig. 11 has for its foundation the $^{4}_{4}$ 8 harness twill drafted thus:

8 ends left to right
6 ends right to left
13 ends left to right
11 ends right to left
} ×2, i. e. until repeat

(8+6+13+11=38—4=34×2=) 68×8 is obtained.

Weave Fig. 12 shows equal drafting of 12 ends one way to alternate with 12 ends the other way of the $^{2}_{2}{}^{1}_{2}{}^{1}_{2}{}^{2}_{2}{}^{1}_{2}{}^{1}_{2}$ 21 harness 45° twill, the pointed twill thus obtained repeating on (12+12=24—2=) 22×13.

Weave Fig. 13 shows a somewhat elaborate design of this system of weaves, having for its foundation the $^{3}_{1}{}^{1}_{1}{}^{3}_{2}{}^{1}_{1}{}^{1}_{1}$ 15 harness 45° twill, drafted thus:

12 ends left to right
5 ends right to left
13 ends left to right
5 ends right to left
} giving us in turn

(12+5+13+5=35—4=) 31×15 as the repeat of the weave, the drawing in draft for which (on 15 harness) is thus: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 11, 10, 9, 8, 9, 10, 11, 12, 13, 14, 15, 1, 2, 3, 4, 5, 4, 3, 2.

Having thus given a thorough explanation of the pointed twills, pointed warp ways, we next come to pointed twills.

POINTED FILLING WAYS,

a system of weaves little used; however, if required, their construction will explain itself by considering previously given weaves turned 45° i. e. warp for filling and filling for warp. In this instance, as will be readily understood by the student, the foundation twill=the number of harness—straight draw—required for the execution of the pointed twill on the loom, the fancy effect being obtained by means of the harness chain. This will require no special examples of weaves on our part.

LESSON.

(1) Construct pointed twill (pointed warp ways) from the $^{2}_{2}{}^{1}_{1}$ 6 harness 45° thus: 7/ 7\ until repeat (7+7=14—2=12×7.)

(2) Foundation: $^{3}_{3}{}^{2}_{1}$ 9 harness 45° twill, draft thus: 6/ 4\ 8/ 4\ and continue in this way until repeat is obtained. Give drawing-in draft.

(3) Foundation: $^{3}_{4}{}^{2}_{1}{}^{1}_{1}$ 12 harness 45° twill, draft thus: 8/ 4\ 6/ 3\ until repeat is obtained. Give drawing-in draft.

The United States consul at Amoy in China writes that a knitting factory would be a profitable venture there. At present there are no textile manufactures in Amoy.

SCOURING AND WET FINISHING WORSTEDS.

It is important that during the scouring process all foreign ingredients, as added to the wool fibre to permit spinning, etc., be removed, at the same time that this is done thoroughly, since otherwise the colors will lack their proper brightness. Soap certainly is the most important agent in this operation, the body of which must be as light as possible, and the alkali so weak that it cannot affect the colors, yet strong enough to start and then remove the dirt and grease in the cloth.

The following example will give a fair idea for the process: Put on sufficient soap to the strings of fabrics to be scoured to thoroughly wet them and run them in this way for about twenty minutes; then thin down with a little lukewarm water, and run for five minutes, after which then rinse completely. To give the goods previously to this final rinse a fuller's earth solution at the rate of a bucketful to four pieces, and to run them in it for fifteen minutes will benefit them considerable. It will be a good plan to strain the fuller's earth solution before using it.

Provided the colors in the goods are found to be dull, a bath of acetic acid given them will brighten them up. Afterwards rinse them well and give a strong bath of common salt. Washing worsteds in the open width is considered superior to the rope method, the cloth coming out of the scouring process cleaner and this in less time than by the rope method, besides a softer feel will be the result, a feature which certainly is an advantage. Again the forming of creases is avoided, certainly another advantage.

In connection with piece dyes, a fabric not properly scoured will make trouble at the dyeing, neither will the fine lustre, so important in the sale of certain goods come up to its standard.

The purpose of this wet finishing process is to limit the shrinkage or felting capacity of the wool fibres in the fabric as much as possible, and at the same time lay the filling in its proper position in the texture. This prevents in a measure the subsequent shrinkage of the fabric, more particularly in its width, and also its drawing out of shape in the succeeding operations of scouring and dyeing. This process of wet finishing is based on the fact that the wool fibre becomes fixed by heat, humidity and pressure, and the wet finishing machine enables the finisher to obtain this result.

Worsteds differ essentially with reference to their finishing operations from that of woolen cloth. With the latter, the aim of the finisher is to preserve the vitality, or shrinking capacity of the fibres, as long as possible, while in connection with worsteds, all finishing operations are designed with the point in view to eliminate these natural tendencies of the wool fibre from the very start.

This wet finishing machine consists of a series of four tanks, of which the first three, as a rule, contain hot water, and the last tank cold water, each tank being equipped with guide rollers, stretching rollers, and squeeze rollers, for guiding, opening the fabric to its full width, and squeezing it. The wool fibre thus softened in the boiling water in the first three tanks, and cooled evenly and thoroughly in the last tank, retains its form in that position much more readily in the cloth structure, losing at the same time its felting capacity. Again all four tanks of the machine may contain hot water, the goods then, after leaving the machine, being rolled up and left to cool while lying in the rolls, the fibres in this manner retaining their position (they being set we might say) more thoroughly than if treated as before explained, they losing in the latter instance all tendencies for a further shrinking.

This machine by means of its most thorough construction, treats the goods evenly all over, every inch getting exactly the same treatment. The boiling water and the squeeze rollers tend to free the goods from soap, provided the goods were fulled any, or from other foreign matter, like size, starch, oil, dirt, dyestuffs, etc. The chances for water marks, washer wrinkles and cloudiness, are by the use of this machine reduced to a minimum. If preferred, the machine may also be used after dyeing.

A deep lustre, with a soft agreeable han-

dle is thus obtained, which is all that can be desired; careful drying follows.

It is a fact that thousands of yards of good cloths are spoiled by the carelessness and inattention of the operatives in the early finishing processes. The only remedy is to rid one's self of such a class of poor help and get those who understand and will give honestly all they know, though somewhat higher wages have to be paid. Better work and fewer rejected pieces will then be the result.

COMBING.

The sliver or ribbon as coming from the carding engine is composed of fibres ranged in fairly parallel order. The next preparatory process to which the sliver is subjected depends upon the character of the fibre or yarn under operation. For the average kind of yarns, drawing is the process following, whereas for the better class of yarns (about 60's and above) the process of combing previous to drawing is introduced, although in some instances one process of drawing may precede combing. Yarn which only passes through the drawing frame is called carded yarn, while that which goes through the comber is called combed yarn. Even yarn depends chiefly upon three factors which are practically unattainable by the use of the card alone:

First, the fibres composing the yarn must be uniform in length. We must acknowledge that this result is impossible to be obtained with the most perfect card of the present day, although the revolving flat card of today approaches nearer perfection than its predecessors. Examining closely a carded sliver will at once convince us that large quantities of irregularly stapled cotton exist therein, and which in turn must be eliminated from the sliver before the higher counts of yarn can be spun.

Second, the fibres must be arranged individually and in parallel order and which position must be maintained. The cotton fibre on account of its natural twist, has a normal tendency to curl up, and consequently readily becomes crossed and tangled during its treatment by the various machines. This is very readily seen if a carded web is closely examined. The fibres, although presented to the action of the card wire in a straight manner, very speedily, as soon as they are freed, assume a crossed and tangled form, due to their natural elasticity, for which reason a considerable amount of drawing is found necessary before they are again restored to a more or less parallel order.

Third, the fibres must be incorporated together in an even manner. By this we mean that the individual fibres composing the sliver must regularly overlap each other in such a way as to give strength to the sliver and in turn afterwards to the roving and yarn. It will be readily understood that with reference to carding, the binding of the fibres into a strand of sliver depends on no fixed method in their distribution or arrangement, a feature which certainly shows a weak spot in the latter process.

It is gratifying to note that these three conditions so necessary to the production of even yarns, are readily obtained in the use of the combing machine. The operation of combing in itself may be defined as the most perfect application of the principle of carding and as its name implies is a combing operation, that is, every fibre of cotton is practically isolated and combed out and maintained in this condition by the pressure of the surrounding fibres. The process also eliminates from the material all the fibres that are below the standard length to be used in the yarn, and at the same time substantially rids the cotton of impurities which may have escaped the carding process. In this manner combing has rendered possible the use of cottons formerly regarded as quite unsuited for the spinning of fine yarns, thus increasing the amount of available material and widening the area of selection, which condition has materially reduced the prices of fine yarns to a lower figure, thereby extending their application and increasing their consumption.

It is a well known fact that comber waste (noils) is worth more than card waste, for which reason some mills will take out less waste on the card, in order to increase the waste on the comber. The disadvantages to this method are that so much extra work being put on the combs is naturally very

injurious to them, besides not allowing as thorough combing of the fibres passing through the comb. Furthermore, each machine (card and comb) is built to do so much work in the preparatory process, and should be run to this. If, as mentioned before, the card is favored, an extra amount of work is thrown on the comber, with the result that quality will suffer. The percentage of short fibres taken out by the comb depends upon the grade of cotton that is used and the fineness of the yarn it is required to spin. Roughly speaking, the amount may vary from 10 to 30 per cent.

When using long stapled cottons heavily charged with impurities it has been found necessary to submit the cotton to a double process of combing, there being several methods in vogue for this process, all subject to varying conditions in fibre, machinery as well as climate. When a ribbon lap machine is used, the most common combination of machines is thus:

1. Sliver lap machine,
2. Ribbon lap machine,
3. Comber,
4. Sliver lap machine,
5. Ribbon lap machine,
6. Comber.

In some instances the ribbon lap machine above referred to is omitted in both processes, a draw frame preceding the sliver lap machine being introduced in both processes.

Although not advisable, except for production, drawing either by ribbon lap or draw frame in either process, is in some instances omitted.

It would seem at first thought that double (and treble when used) combing would produce a much superior yarn than single combing, a feature which, however, is not the case, although double combing certainly improves the character of the yarn. The advantage of double combing is best explained by an example: Suppose we take out 24 per cent. noils with single combing and a total of 24 per cent. with double combing; should not the yarn be as clean from the single combing as from the double? We should say very likely "no" since in double combing we may have taken out only 17 per cent. at the first combing and the remaining 7 per cent. at the second combing. Having double the quantity of needles or combs acting on the cotton, for the same percentage of noils, will necessarily give a more thorough cleaning and combing action to the fibres. The reason for the difference in percentages of the two combings, although the settings for the two combs being practically the same, is found in the fact that in the second combing there is not much short fibre to be dealt with in the cotton under operation. The same affair, in proportion, refers also to treble combing where such is ever used, the difference between second and third combing being less pronounced than between first and second. Treble combing, as readily understood, will result in a high priced yarn, both on account of labor as well as the high price of the raw cotton which has to be used, for which reason it is seldom employed. Besides the advantages attributed to double combing, the same also has its disadvantages, found in the fact that a good deal of trouble is introduced, as the slivers lose some of their strength because the fibres have become so parallel and feel so soft that they stick to almost anything, and when any slight shock or strain is sufficient to break them.

Cans with spring bottoms are frequently used at the coiler, in order to assist the slivers to more readily mount to the top. All plates or guides that the cotton has to impinge against during combing must be kept clean and dry. Combed cotton is much more susceptible to disturbance by electrical influences, or air currents, than carded cotton. A micro-photographic view of combed staples drawn out from a combed sliver will show a true cohesion of the fibres before any twist worth speaking about has been imparted to them, thus possibly explaining the problem how cotton fibres retain their hold on one another when drawn out of the sliver cans; the calendering which combed as well as uncombed fibres receive serving as nothing if it were not for the spirality of the individual cotton fibres, a feature readily proven by the fact that half ripe cotton fibres are more difficult to draw than fully ripe fibres.

Sliver lap machine.—Before the sliver from the card is taken to the comber, it must undergo a preparatory process, because

combing is necessarily a delicate operation. An examination of the arrangement of the fibres in the card sliver shows it to be of such a nature that the needles of the comber would be liable to considerable damage if an attempt were made to comb them in this state; and, secondly, owing to the great irregularity of the card sliver it would be reproduced in the comber, and at the same time cause very unequal work to be thrown on the various parts of that machine, with the result that a great many good fibres would be taken out as waste. In preparing the cotton for the comber, another consideration must be taken into account. When the cotton is passed through the comber, it comes in contact with a series of very fine steel needles, each row having a width of from 7 to 11 inches. This introduces the necessity of making a lap from the slivers for a corresponding width of needles, for which reason the slivers as taken from the card are passed side by side through a machine called a sliver lap machine. This machine doubles 12 to 19 slivers and condenses them into the form of a lap, ready to be placed on the ribbon lap machine or the comber as the case may be. If the ribbon lap machine is to be used, the lap on the sliver lap machine is made 1 1/4 inches narrower than the lap to be made on the ribbon lap machine in order to allow for spreading in said machine. The lap is very compactly made on a wooden spool, 4 inches in diameter, and when full is from 9 to 12 inches in diameter.

The course of the cotton through the machine is shown in Figs. 1 and 2, of which Fig. 1 is a side elevation, with rollers shown in section, and Fig. 2 a plan view of a sliver lap machine.

Starting at the back of the machine, the slivers, A, are passed from the cans, B, separately through small round apertures, C, in the guide plate, D, which by placing in certain positions will put more or less tension on the slivers, A. Passing through the guide plate, D, each sliver, A, goes under a small round bar, E, held by the arms, F, and from there over a spoon lever at G, which is a part of the automatic stop motion on the machine, causing the latter to stop when a sliver, A, breaks or a can, B, runs empty. The small round bar, E, between D and G serves the purpose to keep the slivers better down on the spoons, G, thus obtaining a prompt action of the stop motion. From the spoons, G, the slivers pass down a specially shaped guide plate, H, each sliver being kept separated from the others by means of grooves or channels, I, through which they pass. The slivers are in this manner brought together and made into a comparatively level sheet without overlapping each other as they enter the series of drawing rolls, J, side by side.

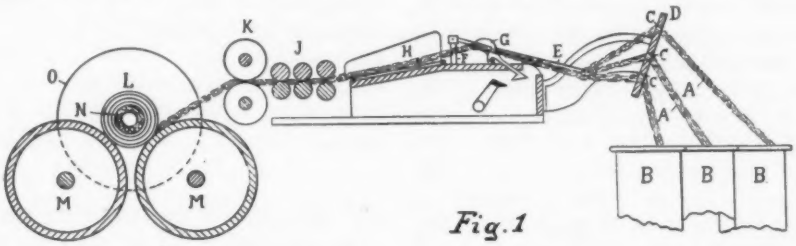


Fig. 1

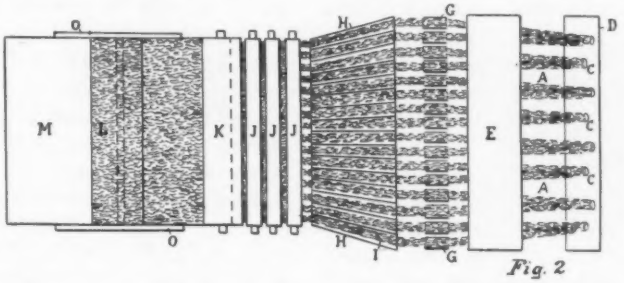


Fig. 2

The object of the machine is not to draw the slivers out, but to lay them side by side in the form of an even lap, for which reason the draft in the rollers, J, is just enough to prevent bulkiness of the lap and should not exceed about 1 3/4 to 2. Emerging from the drawing rolls, J, the cotton is conducted between a pair of heavy calender rolls, K, which compress it into a sheet or lap which enables it to be rolled up. The top calender roller, K, is weighted either by a spring or lever arrangement, at each end, with from 80 to 140 lbs. pressure. Directly the cotton leaves the calender rollers, K, it is wound in the form of a lap, L, upon the wooden spool, N, which is revolved by bringing it in frictional contact with the two large fluted iron rollers, M. This wooden spool, N, on which the lap is wound, has its centre bored out to allow a spindle to pass through it. This spindle has one end threaded and a hand wheel on the other. The threaded end screws into a large plate, the inside surface of which is smooth. The other end of the spindle carries a plate similar to the other one, except for the fact that it carries on its outside hub a saw-toothed edge, which fits into another similar hub which is carried on the spindle. When the lap is to be started the spindle is run through the two plates and spool, which is placed between them, and then the hand wheel is turned in a direction so as to tighten the spool up tight against the face of the plates, and then the racks that hold the plates up are lowered until the spool rests firmly upon the fluted rolls. The cotton is then passed around the spool and the machine started. The edges of the lap, during winding, are kept smooth and even by large, circular, smooth, iron plates, O, placed tightly up to the ends of the wooden spool, and in turn revolving with the spool by means of friction, thus preventing the lap ends from bulging out, also avoiding any friction of the lap ends with the framing of the machine. The lap is made compact in a similar manner as the lap made on a scutcher in the preparatory department, that is, the upward movement of the spindle as extending through the spool, due to the increasing diameter of the bobbin, is retarded by a brake arrangement. This brake acts upon the lap by having the spindle project at both ends through the side plates and held by the projections on the vertical racks, these racks being geared into spurs which are on the same shaft with the brake pulley. This retarding action necessarily causes the lap to wind on the bobbin in a compact manner.

The sliver lap machine is generally fitted with a full lap stop motion, in order to make the bobbins of uniform size. As there are 12 to 19 slivers fed to the machine at one time, another stop motion to take care of these slivers is absolutely necessary to produce an even lap. These two stop motions are shown in connection with Figs. 3 and 4, from which it will be seen that most of the parts are common to both motions.

(To be continued.)

AN IMPROVED CONSTRUCTION OF LAY BEAM FOR C. & K. HEAVY LOOMS.

This lay-beam is made of steel or iron, and comprises two independent metal bars of angle shape in cross section, secured together in such a manner that one of the angle metal bars forms the raceway and the front of the lay-beam and the other the bottom and the rear of the lay-beam. The bottom reed supporting bar extends below and at the rear of the upper side of one metal angle bar.

This new construction will omit the until now necessary large (in its cross section) wooden beam, which, no matter how large, is always liable to warp and get out of shape and in turn interfere with the proper throw of the shuttle through the warp-shed.

Two principles of construction of the new lay-beam are given, viz., Fig. 1, showing partially in section and in elevation such a one as we might term "skeleton construction," and Fig. 2 a corresponding affair of what we can call "solid construction." Quoting numerals of references will readily convey to the student either construction.

One indicates the upper end of one of the lay swords of the loom. Two is one of the two metal bars previously referred to (and which form the gist of the improved lay-beam), i. e., a metal bar made either of iron or steel and of angle shape in cross section which forms the top (or race) of the lay and

also the front side of the lay. Three indicates the other metal angle bar, at the beginning of the article referred to, said bar forming the under side and rear side of the lay beam. Both angle metal bars 2 and 3 (shown in full black in their section so as to bring them up prominently to the notice of the reader) extend the full length of the lay, they being properly attached at either end to the respective lay sword.

At the central part of the lay, where the filling feeler fork is ordinarily placed, the angle metal bar, 2, has an opening therein through its upper part and front side, for the filling feeler fork.

With reference to Fig. 1 it will be seen from this illustration that the two metal angle bars, 2 and 3, i. e., the new lay-beam proper, as we might say, are connected to each other and to the lay swords by what we have previously called a skeleton connection, the details of construction of which refer, strictly speaking, to a mechanical arrangement, well solved by the builders in order to give strength, trueness and durability to

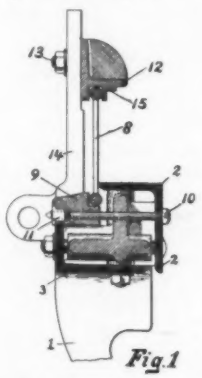


Fig. 1

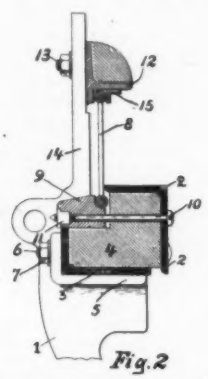


Fig. 2

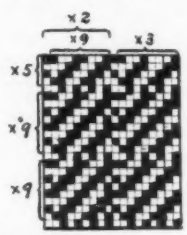
the lay, hence no need for us to go into detail.

With reference to Fig. 2 it will be seen from this illustration that the two metal angle bars, 2 and 3 (and which correspond to those shown in connection with Fig. 1), are adjusted to a wooden beam or bar, 4, which extends the same, as both angle metal bars, the full length of the lay. A side extension or foot, 5, is formed on the upper end of the lay sword, 1, to receive the metal angle bar, 3. The metal angle bar, 2, beam, 4, and metal angle bar, 3, are all secured together and are secured to the rear side of the foot or extension, 5, by bolts, 6, having nuts, 7, on their inner ends.

With reference to the other details of the lay, both constructions are identical, viz.: At the rear part of the lay-beam extends the reed, 8, the lower bar of which extends in a groove or recess in the front upper side of a transverse wooden bar, 9, which rests upon proper supports and is secured in position by the bolt, 10, having the nut, 11, on its inner end. The lower part of the reed is confined and held in position between the grooved portion or recess in the bar, 9, and the rear edge of the upper side of the angle metal bar, 2. The upper bar of the reed extends within a recessed portion on the lower side of a transversely-extending angle shaped metal bar, 12, secured at its ends by a bolt, 13, to the upper end of the lay horn, 14. An angle strip, 15, extends in front of the upper bar of the reed and is secured to the metal bar, 12, to hold the reed in place. Extending along the front surface of this metal bar is a wooden bar, 13, rounded on its front side to form the hand bar of the lay for the convenience of the weaver.

NOVELTIES FROM FOREIGN SOURCES.

Light Weight, Worsted Overcoating.



Complete Weave. Repeat 171 × 167.

Warp:—4915 ends, 9 harness fancy draw.

Reed:—18 × { 1 dent @ 5 ends = 5 ends; 17 dents " 4 " = 68 ends; 1 dent " 5 " = 5 ends; 17 dents " 4 " = 68 ends; 1 dent " 5 " = 5 ends; 5 dents " 4 " = 20 ends } 67 inches wide in loom.

42 dents using 171 ends

Dress:—

1 end, 2/52's worsted, brown ... } × 2 = 146 ends
72 ends, 2/52's worsted, white and drab ... }
1 end, 2/52's worsted, brown ... = 1 end
24 ends, 2/52's worsted, white and drab ... = 24 ends

Repeat of pattern: 171 ends

Filling:—65 picks per inch, arranged thus:

1 pick, 2/52's worsted, white and drab ... } × 2 = 146 picks
72 picks, 2/36's worsted, brown ... }

1 pick, 2/52's worsted, white and drab.....= 1 pick
20 picks, 2/36's worsted, brown.....= 20 picks

Repeat of pattern: 167 picks

Finish:—Worsted finish, 56 inches wide.

Woolen Cheviot Suiting.

Complete Weave. Repeat 64 × 12.

Warp:—2555 ends.
Reed:—19½ × 2=66 inches wide in reed.
Dress:—

2 ends, 4 run woolen yarn, black.....= 2 ends
2 ends, 4 run woolen yarn, white.....= 2 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 4= 8 ends
2 ends, 4 run woolen yarn, black.....= 2 ends
2 ends, 4 run woolen yarn, white.....= 2 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 8= 16 ends
1 end, 4 run woolen yarn, black.....
1 end, 8 run white, and 6 run black twist.....
} × 2= 4 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 4= 8 ends
1 end, 4 run woolen yarn, black.....
1 end, 8 run white, and 6 run black twist.....
} × 2= 4 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 8= 16 ends
1 end, 4 run woolen yarn, yellow.....= 1 end
1 end, 4 run woolen yarn, black.....= 1 end
2 ends, 4 run woolen yarn, white.....= 2 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 4= 8 ends
1 end, 4 run woolen yarn, red.....= 1 end
1 end, 4 run woolen yarn, black.....= 1 end
2 ends, 4 run woolen yarn, white.....= 2 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 8= 16 ends
1 end, 4 run woolen yarn, black.....
1 end, 8 run white, and 6 run black twist.....
} × 2= 4 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 4= 8 ends
1 end, 4 run woolen yarn, black.....
1 end, 8 run white, and 6 run black twist.....
} × 2= 4 ends
1 end, 4 run woolen yarn, black.....
1 end, 4 run woolen yarn, white.....
} × 8= 16 ends

Repeat of pattern: 128 ends

Filling:—43 picks per inch, arranged thus:

1 pick, 4 run woolen yarn, red.....= 1 pick
1 pick, 8 run white, and 6 run black twist.....
1 pick, 4 run woolen yarn, black.....
} × 5= 10 picks
1 pick, 8 run white, and 6 run black twist.....= 1 pick
1 pick, 4 run woolen yarn, yellow.....= 1 pick
1 pick, 8 run white, and 6 run black twist.....
1 pick, 4 run woolen yarn, black.....
1 pick, 8 run white, and 6 run black twist.....
} × 65=130 picks

Repeat of pattern: 144 picks

Finish:—Cheviot finish, scour well, clip on shear, press, steam lustre, press and steam, 56 inches wide.

Light-weight Overcoating.

Complete Weave. Repeat 96 × 4.

Warp:—4000 ends, all 2 ply 7 run d. & tw.; woolen yarn, 8 harness fancy draw.
Reed:—15 × 4 = 66 inches wide in loom.

Dress:—

1 end, dark green and brown.....= 1 end
1 end, green and red.....= 1 end
8 ends, slime-green and white.....= 8 ends
1 end, dark green and brown.....= 1 end
1 end, green and red.....= 1 end
11 ends, slime-green and white.....= 11 ends
1 end, slime-green.....
3 ends, slime-green and white.....
} × 3= 12 ends
61 ends, slime-green and white.....= 61 ends

Repeat of pattern: 96 ends

Filling:—60 picks per inch, all 5 run single woolen yarn arranged thus:

1 pick, green
10 picks, brown
1 pick, green
144 picks, brown

156 picks, Repeat of pattern.

Finish:—Scour well, full, scour, shear clear, press, steam-lustre, press, and steam, 56 inches wide.

Fancy Cassimere.

Complete Weave. Repeat 4 × 4

Warp:—3652 ends, 12 harness straight draw.
Reed:—14 × 4=65¼ inches wide in loom.
Dress:—

1 end, 2/40's worsted, red.....= 1 end
2 ends, 6 run woolen yarn, white.....= 2 ends
2 ends, 6 run wohlen yarn, gray.....= 2 ends
2 ends, 6 run woolen yarn, white.....= 2 ends
1 end, 6 run woolen yarn, black.....= 1 end
1 end, 2/40's worsted, blue.....= 1 end
2 ends, 6 run woolen yarn, white.....
2 ends, 6 run woolen yarn, gray.....
2 ends, 6 run woolen yarn, white.....
2 ends, 6 run woolen yarn, black.....
3 ends, 6 run woolen yarn, white.....
1 end, 6 run woolen yarn, gray.....
1 end, 6 run woolen yarn, white.....
} × 3= 24 ends
3 ends, 6 run woolen yarn, gray.....
3 ends, 6 run woolen yarn, white.....
1 end, 6 run woolen yarn, black.....
1 end, 6 run woolen yarn, white.....
3 ends, 6 run woolen yarn, black.....
2 ends, 6 run woolen yarn, white.....
2 ends, 6 run woolen yarn, gray.....
2 ends, 6 run woolen yarn, white.....
2 ends, 6 run woolen yarn, black.....
} × 4= 64 ends
2 ends, 6 run woolen yarn, white.....
2 ends, 6 run woolen yarn, gray.....
2 ends, 6 run woolen yarn, white.....
2 ends, 6 run woolen yarn, black.....
} × 3= 24 ends
2 ends, 6 run woolen yarn, white.....= 2 ends
2 ends, 6 run woolen yarn, gray.....= 2 ends
2 ends, 6 run woolen yarn, white.....= 2 ends
1 end, 6 run woolen yarn, black.....= 1 end

Repeat of pattern: 128 ends

Filling:—57 per inch, arranged thus:

1 pick, 2/40's worsted, blue.....= 1 pick
2 picks, 6 run woolen yarn, black.....= 2 picks
1 pick, 2/52's worsted, black and white.....= 1 pick
3 picks, 6 run woolen yarn, black.....= 3 picks
1 pick, 2/52's worsted, black and white.....= 1 pick
1 pick, 2/40's worsted, red.....= 1 pick
1 picks, 6 run woolen yarn, black.....= 2 picks
1 pick, 2/52's worsted, black and white.....
3 picks, 6 run woolen yarn, black.....
} ×8= 32 picks
1 pick, 2/52's worsted, black and white.
1 pick, 6 run woolen yarn, black.....
4 picks, 6 run woolen yarn, black.....=4
} ×8= 64 picks
1 pick, 2/52's worsted, black and white.....
3 picks, 6 run woolen yarn, black.....
} ×9= 36 picks
1 pick, 2/52's worsted, black and white.....= 1 pick

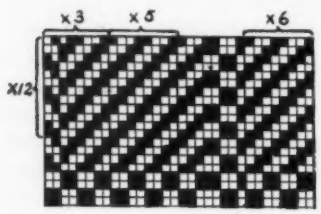
Repeat of pattern: 144 picks

Finish:—Melton finish, full slightly, clip on shear, press, steam lustre, press and steam.

India exports annually about 560,000 tons of jute.

Worsted Suiting.

Complete Weave. Repeat 108×112.



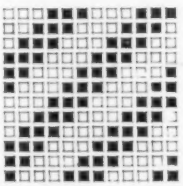
Warp:—3865 ends.
Reed:—15×4=66 inches wide in loom.
Dress:—

1 end, 2/36's worsted, black 2 ends, 2/45's worsted, black and gray 1 end, 2/36's worsted, black	× 8=	32 ends
1 end, 2/36's worsted, black	=	1 end
2 ends, 2/45's worsted, black and gray	=	2 ends
3 ends, 2/36's worsted, black	=	3 ends
1 end, 2/45's worsted, black and gray 1 end, 2/36's worsted, black	× 4=	8 ends
1 end, 2/45's worsted, black and gray	=	1 end
1 end, 2/64's worsted, red brown	=	1 end
1 end, 2/45's worsted, black and gray 1 end, 2/36's worsted, black	× 5=	10 ends
1 end, 2/45's worsted, black and gray	=	1 end
3 ends, 2/36's worsted, black	=	3 ends
1 end, 2/45's worsted, black and gray 1 end, 2/36's worsted, black	× 4=	8 ends
1 end, 2/45's worsted, black and gray	=	1 end
1 end, 2/64's worsted, blue	=	1 end
1 end, 2/45's worsted, black and gray 1 end, 2/36's worsted, black	× 5=	10 ends
1 end, 2/45's worsted, black and gray	=	1 end
3 ends, 2/36's worsted, black	=	3 ends
1 end, 2/45's worsted, black and gray 2 ends, 2/36's worsted, black 1 end, 2/45's worsted, black and gray	× 5=	20 ends
1 end, 2/45's worsted, black and gray	=	1 end
1 end, 2/36's worsted, black	=	1 end

Repeat of pattern: 108 ends

Filling:—64 picks per inch, counts of yarn, color, arrangement same as in warp.
Finish:—Worsted finish, 56 inches wide.

Worsted Suiting.



Complete Weave.

Repeat 6 × 6.

Warp:—5660 ends, 12 or 18 harness straight draw.
Reed:—14½×6=65 inches wide in reed.
Dress:—

1 end, 2/52's worsted, light gray and dark gray. 5 ends, 2/56's worsted, black	× 4=	24 ends
1 end, 2/56's worsted, light gray and dark gray. 2 ends, 2/56's worsted, black	× 24=	72 ends
1 end, 2/72's worsted, orange	=	1 end
2 ends, 2/56's worsted, black	=	2 ends
1 end, 2/56's worsted, light and dark gray	=	1 end
2 ends, 2/56s worsted, black	=	2 ends
1 end, 2/72's worsted, blue-green	=	1 end
2 ends, 2/56's worsted, black 1 end, 2/56's worsted, light and dark gray 2 ends, 2/56's worsted, black	× 24=	72 ends
	=	2 ends

Repeat of pattern: 180 ends

Filling:—85 picks per inch, arranged thus:

1 pick, 2/56's worsted, light and dark gray 5 picks, 2/56's worsted, black	× 4=	24 picks
1 pick, 2/56's worsted, light and dark gray 2 picks, 2/56's worsted, black	× 27=	81 picks
1 pick, 2/72's worsted, orange	=	1 pick
2 picks, 2/56's worsted, black	=	2 picks
1 pick, 2/56's worsted, light and dark gray	=	1 pick
1 pick, 2/72's worsted, blue-green	=	1 pick
2 picks, 2/56's worsted, black 1 pick, 2/56's worsted, light and dark gray 2 picks, 2/56's worsted, black	× 26=	78 picks
	=	2 picks

Repeat of pattern: 192 picks

Finish:—Worsted finish, 56 inches wide.

BOBBINS FOR NORTHROP LOOMS.

In bobbins for this style of looms there is ordinarily left on the bobbin a large bunch of thread, for the reason that in bobbins of this character the feeler strikes the thread on the bobbin until it is sufficiently reduced to avoid the feeler and enable the bobbin to be thrown off. It is the object of the new bobbin, the invention of T. E. Lemyre of Manchester, N. H., to do away with this waste and utilize almost all of the yarn originally placed on the bobbin in the spinning room, so that when the bobbin is thrown off automatically, by the devices provided for this purpose to the loom, there is but very little thread left wound around it.

This feature is accomplished by the peculiar construction of the new bobbin, i. e., mainly by the employment of a cone on the spindle, said cone receiving the blows of the feeler and being held in position by the thread until but little thread is left on the spindle, when the cone falls or yields and allows the bobbin to be thrown off. In the bobbin thus referred to a hollow cone is retained on the spindle below the head by means of a ring on the spindle.

Lately an improvement in the construction of this bobbin has been invented by J. H. Whitten also of Manchester, N. H., by means of which the ring is done away with and the hollow cone retained in position on the spindle by means of ears which extend from its smaller end into longitudinal slots formed in the spindle at a suitable distance from the head, the principal object of the improvement being, as mentioned before, to do away with said ring as previously referred to, and provide a better means of engagement with the spindle, and thereby simplify the construction of the bobbin without in any manner lessening the efficiency in operation.

The nature of the invention is fully illustrated in the accompanying drawings, in which Fig. 1 is an elevation of the bobbin, as originally invented by Mr. Lemyre, with the thread nearly unwound from it and the cone in a position to allow the bobbin to be thrown off. Fig. 2 is a longitudinal section of the bobbin in a full condition, and Fig. 3 an elevation of the bobbin with the thread nearly unwound from it and the cone in position to allow the bobbin to be thrown off. Both illustrations, Figs. 2 and 3, refer to the new construction of the bobbin, as improved by Mr. Whitten.

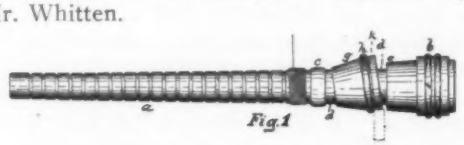


Fig. 1

Fig. 2

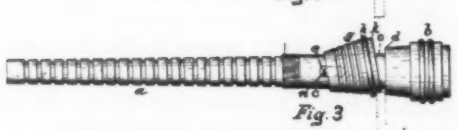


Fig. 3

Referring to illustration Fig. 1, letters of reference indicate thus: a the spindle, b the head, c a metallic ring rigid on the spindle at a suitable distance from the head. The portion d. of the spindle (between the ring, c, and the head, b), is of even diameter, the head, b, being provided with an annular shoulder, e. On portion d is placed a hollow metal cone, g, tapered on its inner surface as well as on its outer surface. The cone is formed up near its larger end with an annular rib, h, and said end is of suitable size to overlap said shoulder, e, as indicated by the portion, k. Ring, c, confines the cone between it and the head of the spindle. When the spindle is loaded, the thread is wound around the cone, g (whose portion, k, overlaps the inner edge of the head), until the thread covers the main portion of the cone up to the rib h. This rib is left bare and is so located that it will receive the blows of the feeler; but when the thread is unwound therefrom the cone slips off from the head and falls loosely on the portion, d, of the spindle, as shown in our illustration, Fig. 1, thus offering no resistance to the feeler (shown in dotted lines). In other words, the rib on the cone takes the place of the thread on the bobbin at that point, therefore the thread is all unwound from the cone and only a small portion left on the spindle by the time the cone is released by the unwinding of the thread, so as to fall and leave a space into which the feeler flies without striking the cone. Hence when the picker throws off the bobbin there is but little thread left wound around it. The ring, c, as will be readily understood, is placed there to limit the movement of the cone, but to allow it to tip, as shown.

This ring, as previously referred to, is done away with in the new construction of the bobbin, as shown respectively by means of Figs. 2 and 3. In these two illustrations letters of reference indicate thus: a the spindle, b the head, c even portion of spindle (equals d in Fig. 1), d annular shoulder to the head. The portion, c, of the spindle is provided on opposite sides with longitudinal slots, e, and a hollow metal cone, g, tapered on its inner and outer surfaces, as indicated in Fig. 2. This cone is formed near its larger end with an annular rib, h, said end being of a size to overlap shoulder, d, as indicated by the portion, k. Cone, g, is confined to the portion, c. of the spindle by means of inwardly, extending engaging ears, n, bent at obtuse angles from opposite sides of the smaller end of the cone into the opposite longitudinal slots, e.

When the spindle is loaded, the thread extends around it, as illustrated in Fig. 2, and is wound around the cone, g, until the thread covers said cone up to the rib, h, which is left bare to receive the blows of the feeler (shown in dotted lines). While there is a thread on the cone it remains in the position indicated in Fig. 2, but when the thread is unwound therefrom the cone slips off from the head and falls loosely on the portion, c, of the spindle, offering no resistance to the feeler, the rib, h, taking the place of the thread on the bobbin at that point. The cone, however, is not disengaged from the spindle, although there is no ring, as shown in connection with the first construction, to prevent it from slipping down, but is always held in loose engagement by means of the ears, n, and slots, e.

THE MANUFACTURE OF LAMP WICKS.

The same may be divided into

(1) Double cloth structures united by means of a special binder warp;

(2) Double cloth structures technically known as hose, and

(3) such as produced by means of braiding machinery.

FIRST DOUBLE CLOTH STRUCTURES UNITED BY MEANS OF A SPECIAL BINDER WARP.

These lamp wicks, produced on what is known as narrow ware looms, are designed for flat flame burners, and in their general appearance resemble a heavy, coarse, cotton ribbon, the principle observed in the manufacture of these wicks, as well as in the other kind (hose),

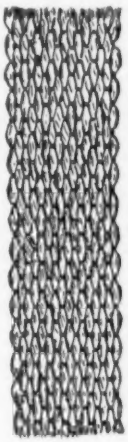


Fig. 1

being to use a more or less loose twisted warp, so as to give to the wick as much absorbent power as possible, in order to freely transfer the headlight oil from its reservoir to the flame. This feature required, will also at once explain why we are compelled to use a double cloth structure for these flat flame wicks, since by means of such the oil will travel more easily, and besides a broader surface flame (2 fabric structures actually side by side) be the result, than if single structures were used.

GENERAL POINTS OF FABRIC STRUCTURE.

These flat wicks are made in various widths, from ⅜ inch to 1 inch being average sizes most frequently needed; however, wider sizes are often met with, and also in some instances narrower wicks.

Diagram Fig. 1 gives us an illustration of a ⅝ inch wide standard wick.

Fig. 2 shows the weave required for producing said structure, the same repeating on 38×4.

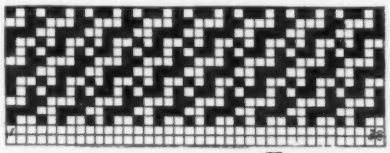


Fig. 2

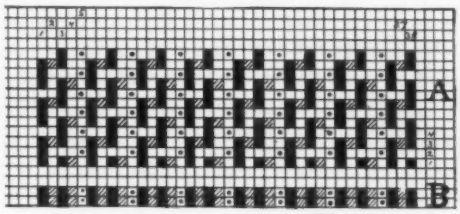


Fig. 3

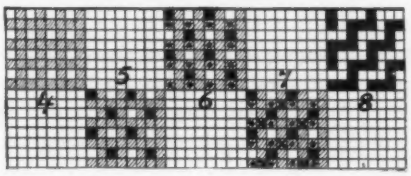


Diagram Fig. 3 is given to illustrate the weave more in detail, A being the weave analyzed, and B the scheme for the arrangement of the warp, viz:

1 end face 1 end back	×2=4 ends	×7=35 ends
1 end binder	=1 end	
1 end face		= 1 end
1 end back		= 1 end
1 end face		= 1 end
Repeat of pattern:		38 ends

Face warp is shown by means of full black type.

Back warp is shown by means of shaded type, and

Binder warp is shown by means of dot type.

Examining weave Fig. 2 (and consequently also its analysis 3A) in a technical way, we find that the double cloth structure, i. e. face warp, back warp and the filling interlaces on what is known as the "double plain weave"=

1 face, 1 back warp and filling with the plain weave for either structure.

In order to illustrate the affair to the novice diagrams Figs. 4, 5, 6, 7 and 8 are given.

Fig. 4 shows the plan for laying out the point paper for a double plain 1:1 in warp and filling, showing the face warp and filling left white, the back warp and filling being shown shaded.

Fig. 5 shows: "Put the face weave (in this instance the common plain) on the face systems of threads." See full black type.

Fig. 6 shows the next step added to diagram Fig. 5, viz: "Raise all the face warp on every back pick." See dot type.

Fig. 7 shows the next progression step: "Put the weave for the back structure (in this case again the common plain) on said fabric." See cross type.

Fig. 8 shows weave Fig. 7 executed in one kind of type, it being the same weave as used in Fig. 2, i. e. the weave for a lamp wick previously given.

Reconsidering said weave Fig. 2 we find used besides said double cloth structure thus explained, binder warp threads 4, 9, 14, 19, 24, 29 and 34 respectively (see also dot type in Fig. 3 for it) and which warp threads interlace with the filling on the pure plain weave, in this manner uniting the two structures (face and back fabric) the wick is composed of in one affair, for practical use in the lamp.

Diagram Fig. 9 shows the respective interlacing of the five warp threads, called for in one repeat of the lamp wick weave Fig. 2, shown in full black lines and lettered at the right hand side of the diagram with numerals of references 1, 2, 3, 4 and 5 respectively, corresponding in turn with the same numerals given on top of diagram 3A viz:

No. 1 in diagram Fig. 9 = warp thread No. 1, shown in full black type, in diagram Fig. 3.
No. 2 in diagram Fig. 9 = warp thread No. 2, shown in shaded type, in diagram Fig. 3.
No. 3 in diagram Fig. 9 = warp thread No. 3, shown in full black type, in diagram Fig. 3.
No. 4 in diagram Fig. 9 = warp thread No. 4, shown in shaded type, in diagram Fig. 3.
No. 5 in diagram Fig. 9 = warp thread No. 5, shown in dotted type, in diagram Fig. 3.

This section of the fabric structure, given to show the interlacing of the various warp threads required in one repeat of the weave, will show to the student that warp threads 1, 2, 3, and 4, i. e. the face and back warp, interlace more loosely with the filling than binder warp threads, (5), for which reason the latter warp thread must be run of a different warp beam, i. e. spool, since more length of binder warp, compared to face or back warp, is required, i. e. the former will "take up" more than the latter. The circles in diagram Fig. 9 refer to the sections of the filling, one repeat of the weave, i. e. the first four picks being numbered respectively 1 to 4 in said circles.

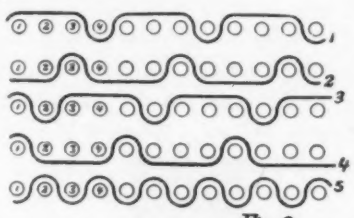


Fig. 9

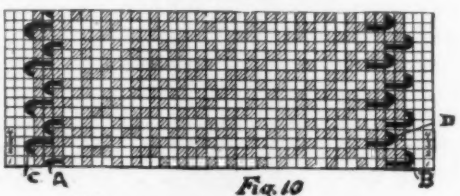


Fig. 10

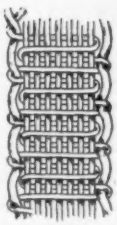


Fig. 11

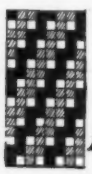


Fig. 12

THE FORMATION OF A GOOD SELVAGE

forms a most important item in the construction of these fabrics in order to permit easy raising and lowering of the wick in the burner. To illustrate the formation of such a selvage diagrams Figs. 10 and 11 are given.

Diagram Fig. 10 shows the weave, as previously referred to in Fig. 2, executed in shaded type, the interlacing of the filling with the edge threads being shown in heavy black. The filling (or pick) A on its 1st pick enters in a back pick of the structure; at B it passes at the clear outer edge of the fabric in the face structure,

respectively in pick No. 2; at C the same affair is duplicated on the other side of the fabric, the filling then returning in pick No. 3 in the back structure, returning in turn in pick No. 4 (see D) in the face structure, but in this instance

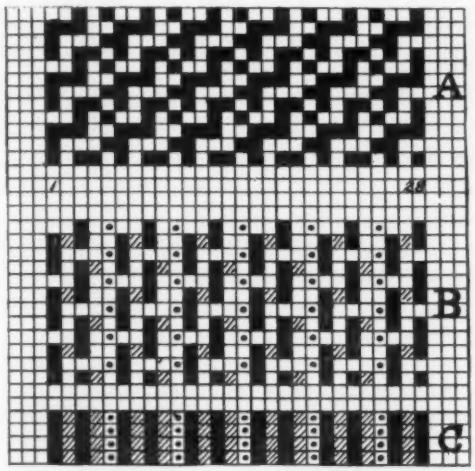


Fig. 13

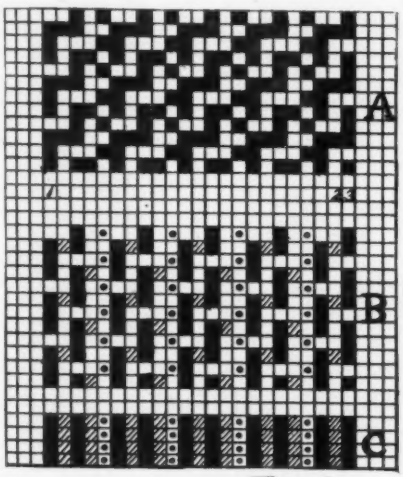


Fig. 14

without calling for the most outside situated face thread; the same affair being the case at the other side of the fabric, i. e. return of filling after leaving pick No. 4 in pick No. 5=No. 1= one repeat of the weave.

Diagram Fig. 11 shows the affair more clearly to the student, the face and back warp threads, with the exception of the outer end of the first-mentioned system, on each side, being shown as taken off from the fabric. the diagram in question clearly showing the hitching on of the filling, once on each edge of the fabric, in one repeat of the weave.

Diagram 12 shows the interlacing of the face or the back threads only, the back and binder warp or the face and binder warp as the case may be, being omitted. This diagram is given in order to show the student the formation of the twill line characteristic to these fabrics—at a first glance to the novice, the heavy count of warp yarn used (necessary) being the cause of it, the shaded and full black effect in the diagram showing the reason *then* for it.

THE SIZE OF LAMP WICKS,

as previously mentioned, varies according to the various sizes of burners used in connection with different lamps.

Diagram Fig. 13 shows in A the weave for a wick calling for 28 warp threads only, viz: 12 ends face, 11 ends back and 5 binder ends: B is the analysis of this weave, and C the scheme for the arrangement of the warp with reference to the weave.

Diagram Fig. 14 shows a similar weave, analysis and scheme of warp for a somewhat still narrower fabric structure, calling for 23 warp threads and referring to a lamp wick about 3/8 inches wide only.

COLOR EFFECTS.

Like all woven fabrics, lamp wicks seem to be also subjected to styles, the latter in the present instance, as will be readily understood by the student, refers to striping of the face and back warp (by means of colored threads), blue being a most frequently met with color. To illustrate the subject two different colorings being given.

Fig. 15 shows such a fancy wick, F indicating the two fancy face warp threads as forming the stripe effect in the fabric on one side.

Fig. 16 illustrates the weave for it, shaded type showing the regular white (grey) warp; F, or full black type, the fancy face warp threads, and B, or dot type, the fancy back warp threads. Repeat of design, 38 warp threads.

Fig. 17 shows another sketch for such a fancy wick, but of a different color arrangement, and Fig. 18 is the weave for it, showing also the placing of the different colors by change of type as quoted in connection with the previously given example.

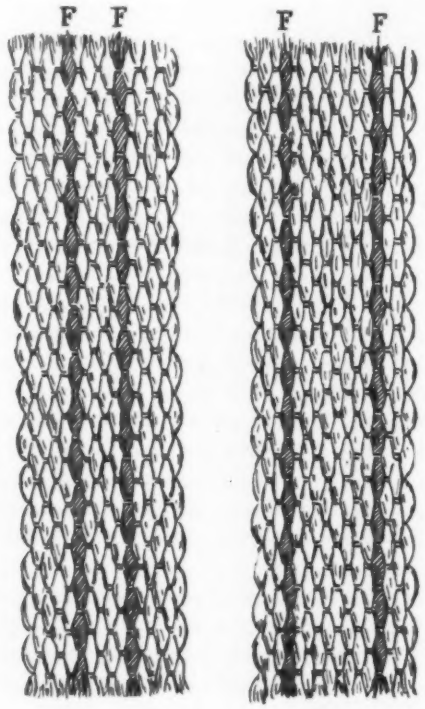


Fig. 15 Fig. 17

A DIFFERENT FABRIC STRUCTURE

of a lamp wick than those previously referred to is shown in connection with illustrations 19 to 23, the same referring to a more close set warp texture as compared to the former structures, and where it would be impossible to use the plain weave for binders, using this time $\frac{2}{3}$ for this purpose, i. e. only one half the number of interlacings of said binder warp in a given number of picks are required.

Fig. 19 shows such a lamp wick (actual fabric size=17/16 inches wide) and Fig. 20A the weave and Fig. 20B the analysis for said weave viz:

Full black type=face warp; shaded type=back warp, and dot type=binder warp.

Fig. 21 is a diagram showing in section the five warp threads in one repeat of the weave, viz:

Warp thread 1 = warp thread No. 1 in weave, shown in full black type in analysis.
Warp thread 2 = warp thread No. 2 in weave, shown in shaded type in analysis.
Warp thread 3 = warp thread No. 3 in weave, shown in full black type in analysis.
Warp thread 4 = warp thread No. 4 in weave, shown in shaded type in analysis, and
Warp thread 5 = warp thread No. 5 in weave, shown in dot type in analysis.

The last mentioned warp thread (5) is one of the binder warp threads as required for uniting the two plain structures into one fabric.

A fancy color effect for such a wick is shown by means of Figs. 22 and 23.

Fig. 22 shows a fabric structure, and Fig. 23 the weave required, being shownin different type in order to simplify the color effect to the student, viz:

Repeat of weave, 102 warp threads; width of fabric, 1 inch; shaded type=white (i. e. in the grey) warp; full black type= warp threads

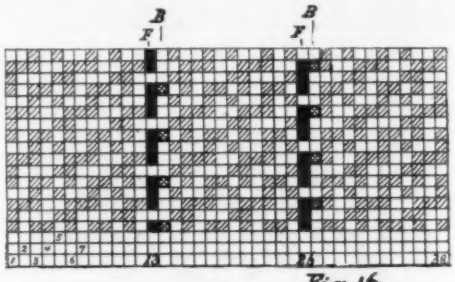


Fig. 16

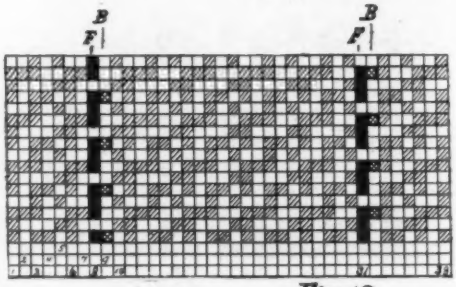


Fig. 18

13 and 88=fancy face warp threads, and dot type=warp threads 14 and 89=fancy back warp threads.

2D.—DOUBLE CLOTH STRUCTURES TECHNICALLY KNOWN AS HOSE.

This kind of lamp wicks are known as

"wicks for round burners," and in their common construction are nothing more but fabrics interlaced with the common double plain weave

using either a 2, 3 or 4 fold 2 ply warp thread for each warp thread of the weave in connection with a 2, 3 or 4 ply filling. Both the upper and lower cloth interlace with the common plain weave, the filling alternately passing in the upper and then in the lower cloth.

It must be mentioned here that for these round wicks an uneven number of warp threads must be used, for example, 55 warp threads, and when 28 warp threads are used for the upper structure in the loom and only 27 warp threads for the lower structure in the loom, since this arrangement prevents 2 warp ends at

Fig. 19

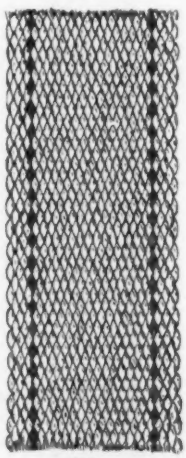


Fig. 22

the edge from running together (interlacing with the filling alike) and in turn form an imperfect connection, i. e., imperfect wick. The threading of the reed must also be taken into consideration. For example, in connection with a texture reeded 4 end per dent use at either edge only 2 ends per dent and in the next dent draw 3 ends previously to reeding all the the way 4 ends per dent. Using less ends per dent at the edges of the fabric is required for the fact that at these places the filling during weaving is interlacing tighter (more tension) and that in turn the warp threads there are pulled more closely together than compared to such as in the other portion of the fabric.

Diagram Fig. 24 shows such a wick, calling for its execution at the loom for the following particulars:

Width of fabric—1⅞ inches.

Warp threads for upper structure—34, four fold 2 ply cotton.

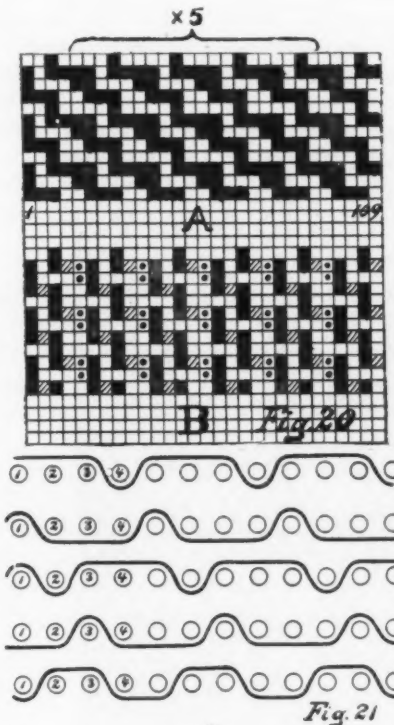


Fig. 20

Fig. 21

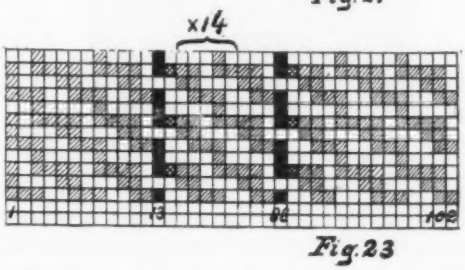


Fig. 23

Warp threads for the lower structure—33, four fold 2 ply cotton.

25 pick per one inch in loom, of a 4 ply filling.

It will be readily understood that the width of these lamp wicks can be either increased or decreased, as the size of the burner will require;

from 1⅛ inch to 2½ inch wide structures, on the loom, being fair average sizes met with in the market.

FANCY STRUCTURES IN ROUND LAMP WICKS.

The first affair refers again (the same as explained in connection with flat lamp wicks) to fancy striping by means of fancy (mostly blue) warp threads, used to suit a certain kind of stripe required. Mostly it will be one fancy colored thread introduced in the centre of each structure i. e. one thread for the upper structure and the joining end in the weave of the lower structure; again the striping may be done only in connection with one of these structures. Whichever may be the case, explanations given in connection with the striping of flat wicks will readily explain the subject.

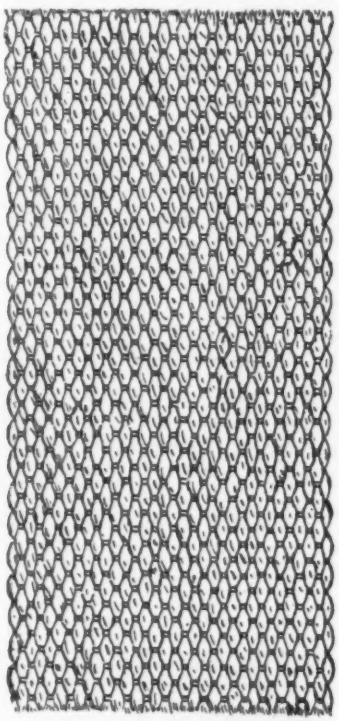


Fig. 24

In connection with some round burner lamps, wicks are required which for a portion of their length (about for one half) are not hose.

Fig. 25 shows such a lamp wick, the same being from a to b true hose and from b to c open on one side.

It then follows that in the portion of the fabric from a to b double plain 1 : 1 in the filling is used whereas in the portion b to c double plain 2 : 2 must be used; in other words in the portion a to b of the fabric the shuttle travels alternately first through one structure and in turn through the other structure, whereas in the portion b to c of the fabric, the shuttle travels to and fro, first both ways in one structure and next in the other structure, in this manner only uniting the structure at that edge where the shuttle travels from one structure to the other, the other edge of the structure being left open on account of the shuttle returning in the same (upper or lower as the case may be) structure of the fabric. In order to better explain the

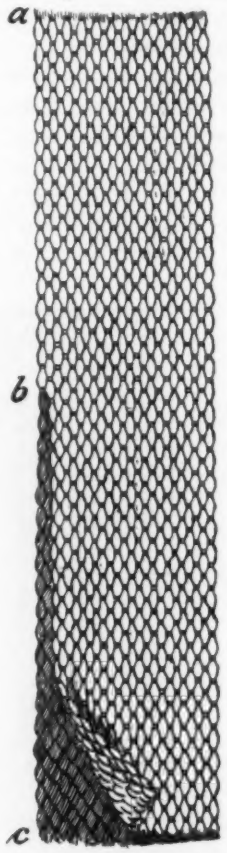


Fig. 25

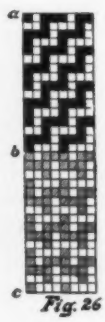


Fig. 26

subject to the student diagram Fig. 26 is given, and in which portion of weave a to b — as shown by means of full black type shows the formation of "full hose" weaving and portion of weave b to c — as shown by means of shaded type shows the formation of "split hose" weaving as we may call it.

It will be readily understood that the 16 picks of each style of weaving (hose or split hose) as shown in connection with weave Fig. 26, are

Fig. 27

any number of times duplicated previously to changing on the other system of weaving; the affair in connection with fabric structure Fig. 25 refering to: length of wick 6 inches; full hose 3 inches; split hose 3 inches; picks per 1 inch = 30 thus: 30 × 3 = 90 picks full hose (as shown by means of full black type in weave Fig. 26, a to b) and 90 picks split hose (as shown by means of shaded type in weave Fig. 26, b to c) are required for one length of wick.

Having thus far given a most thorough description of woven lamp wicks, we now come to

3RD.— SUCH AS PRODUCED BY MEANS OF BRAIDING MACHINERY.

Fig. 27 illustrates such a wick, the same refering to a round structure of about ¼ inch diameter, composed of ten strands of slightly twisted two-fold roving, encased in a covering of braiding; the average length of the wick in question being about 7 inches, being used in miners' and similar lamps.

THE MANUFACTURE OF ENGINE HOSE, ETC., might be also here refered to, for the fact that with reference to its theory of construction the same is closely related to that of the round burner or hose lamp wicks, only that in the present instance we refer to larger fabric structures. In place of cotton, strong hemp yarns are used, 3 ply for warp and a five ply loose twist for the filling. Two warp threads are entered into one heddle eye. The filling is well beaten up, calling for a take up of the warp of from 20 to 25 per cent.

Fig. 28 shows the weave for these fabrics, repeat 4 × 4.

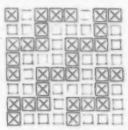


Fig. 28.

BAGS WITHOUT SEAMS.

are another kind of fabric, in theory in their construction, closely related to that present referred to system of double cloth structures. In weaving these fabrics, enter 2 picks alternately in the upper and lower fabric structure. This will result in that, where the filling (cone shuttle) travels from one structure to the other, said two structures are united, thus forming the bottom of the bag, whereas the open end of the bag is produced on the other side.

Fig. 29 shows the weave, repeat 4 × 4.

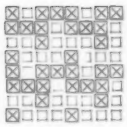


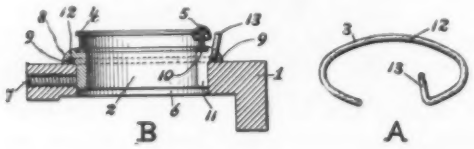
Fig. 29.

Previously to and after the required width of the bag has been woven, the selvages of the bag are produced by means of single cloth weaving, then uniting all the warp-threads into one structure. The weave best adapted for this purpose is the $\frac{2}{2}$ 4 × 2 rib weave i. e. plain weave having two warp threads interlacing alike. The selvage is then turned inside the bag.

In some instances these bags without a seam are woven closed on both sides, similar to "hose" weaving previously referred to, and in which instance weave Fig. 28 is made use of. In this case single cloth has to be woven for a few picks, in order to produce a bottom for the bag, previously to the hose weaving, again the ends of the bag thus produced require seaming to keep the filling from ravelling out.

AN INGENIOUS TRAVELER CLEARER FOR RING SPINNING FRAMES.

This new device, the invention of C. E. Riley, is brought on the market by the Howard & Bullough American Machine Company and on account of its simplicity of construction will at once commend itself to the notice of cotton manufacturers, since by its use and the means provided in connection



with it for holding the same, the clearer is thus easily and firmly secured in its correct position to remove the fibre from the traveler with only one bend in the clearer and this without removing the ring from the ring holder, thereby lessening the cost of the same.

The means for holding the traveler clearer in the ring holder consists of a circular groove in the bottom of the ring holder supporting flange, the usual slot in the ring holder, and the top of the ring rail, and a set screw in screw-thread engagement with the ring rail and bearing on the ring holder.

In order to more clearly explain the construction, i. e., shape of this new traveler clearer and its adjustment in the ring holder, the accompanying illustrations are given, and of which Fig. A is a perspective view of this improved semicircular wire traveler clearer, and Fig. B a transverse sectional view taken centrally through the ring rail, ring holder, traveler clearer, and ring, clearly showing the means for securing the clearer to the ring holder and the ring holder to the ring rail.

Numerals of references accompanying the illustrations indicate thus: 1 is the ring rail of a spinning frame, 2 the ring holder, 3 the semicircular wire traveler clearer, 4 the ring, and 5 the traveler. The ring rail, 1, has the usual circular hole, 6, and the set screw, 7, which extends through the ring rail from its outer edge to the hole, 6. The ring, 2, extends downwardly in the hole, 6, in which it is secured by the set screw, 7, and has the outwardly extending circular flange, 8, in the bottom of which is the circular groove, 9, the circular recess, 10, in the top of ring, 4, and the usual slot, 11, by which the ring holder is sprung outward to receive the ring. The wire traveler clearer, 3, has the semicircular portion, 12, shaped to fit in the groove, 9, and the upwardly bent end, 13, adapted to extend upward through the slot, 11, in the ring holder, as shown in Fig. B.

It will be readily seen that by means of the groove, 9, in the bottom of the flange, 8, of the ring holder, 2, the semicircular portion, 12, of the wire clearer, 3, is firmly held in the groove, 9, between the bottom of the groove and the top of the ring rail, 1, as shown in Fig. B, and can be easily removed or replaced by loosening the set screw, 7, and removing the ring holder, 2, from the ring rail, 1. The circumference of the groove, 9, being greater than the circumference of the ring, 4, brings the upwardly bent end, 13, of the clearer, 3, through the slot, 11, in the ring holder, in its correct operative position in relation to the traveler, 5, with the use of only one bend in the clearer, as shown in Fig. A.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

FINES IN WOOLEN WEAVE ROOMS.

Editor Textile World Record:

I noticed recently that the weavers in a Worcester County woolen mill struck on account of fines imposed for imperfections in the work. This brings to my mind many annoying experiences in connection with imperfect work and the fine system. There seems to be quite a diversity of opinion among superintendents and manufacturers on this point, and I would like to know what is the practice among woolen mills in this matter. In my own case we have given up the fine system and if a weaver does not make good cloth after one or two reprimands we let him go and get another. No system of fining that the manufacturer can impose would compensate him for poor cloth. It seems to me the main thing is to get perfect work. I should like to hear from some of my brother superintendents on this point, and if they impose fines, what is the schedule. Little Rhody (571).

As this question is one that is of general interest to manufacturers, superintendents and overseers, we have obtained an expression of opinion from men in different parts of the country, and their views will be read with interest. We should be glad to hear from others.

A superintendent of a Western woolen mill says: "We use a fine list here, and it has been used in every mill with which I have ever been connected. It is applied justly and impartially, and I think it is the best and fairest way of getting good results in the weave room. Berwick."

A manufacturer in Maine writes: "We have the following fine list posted in our weave room:

Wrong bobbin	25 cents
Double mispick	25 cents
Wrong start	5 cents
Mispick	5 cents
Broken pick	5 cents
Float	5 to 15 cents
Thread out	2 cents per yd.
Wrong draw	3 cents per yd.

"We find a system of fining to be helpful in restraining weavers who would otherwise get careless and make bad work. If a weaver who is honestly trying to turn off perfect work offends, the overseer uses his judgment whether to impose the fine or not. The weavers' claim that some of the imperfections in weaving are caused by imperfect work in other departments has a grain of truth in it, and yet the weaver should try to avoid, and correct, as far as possible, the results of such work. In places where the operatives are mostly natives or family help, the mill that does not fine, but makes it a point to encourage and keep only reliable and conscientious help will be better off in the long run. In cities where the manufacturer is largely dependent on transient or floating help, it would be quite impossible to get good results without some means of restraint, but its enforcement should be accomplished with discrimination and good judgment.

"Weston."

A superintendent who has also had a wide experience as overseer of weaving in mills in different parts of the country writes: "Some years ago I worked in one of the largest mills in Rhode Island. There they had a fine system, which I thought then and still think was a very high list. The work was all white worsted, and the greater part of the warps went very poorly, and the others not well enough to be sure that every cut woven would be perfect. If the weaver happened to take out more than two picks to the inch he was fined one dollar. A small float cost 25 to 50 cents; wrong bobbin, 50 cents. If by chance a bobbin was mixed with one of different quality or size before coming to the weave room the weaver had to pay for it. I don't know whether this system is now in force at that mill, but probably not. At that time they had a very good price list, but

after the fines were taken out it was no more than the average made in other mills where there was very little fining done.

"I believe the best plan is to give the weavers a good, fair trial, and then, if they cannot make good cloth, let them go and try others. There are plenty of good weavers to be had if they are sure of fair treatment. Many of the new weavers that are coming into the mills in these later days are not up to the old standard. They are the ones that are being fined. In the mill just alluded to the cloth woven on the night run was coming off very poorly, so the superintendent had all the stools and boxes taken away, and the weavers had to stand up. They were paid 1 cent a yard more for standing. I thought it a hardship to make the weavers stand from 6.30 p. m. to 6.15 a. m., and possibly be kept awake for hours during the day by the noise on the streets.

"It seems to me the best way is to pay more for good cloth than for poor cloth. Some such arrangement as this should work to good advantage. Pay the weaver whose cut is imperfect, say, 6 cents a yard for 40-pick, 3-shuttle work, and the weaver that makes perfect cloth, 7.4 cents per yard. That would encourage the good weaver and give the poorer one an incentive to make every cut a good one. Greenwich."

A superintendent in a Philadelphia mill writes: "Although I do not like the idea of imposing fines for bad work, I do not know of any other practical means of obtaining the best results. While employed by one firm, I instructed the piece examiner to see that a certain standard of work was maintained, and that any piece coming below that standard should be shown to the weaver, and if the weaver was a good one and usually made good work, she should be cautioned, but not fined. If this warning should have no effect, and she made a second bad piece, then she should be fined and I should be advised.

"If she was not a good weaver, then she should be fined if the work were below the standard, and she should be warned that the fine would be doubled if another piece were sent down as bad as the first within a week or two from that time.

"I have at times instructed that the whole price of a cut be deducted on account of bad work. In such cases the weaver would be discharged, if good weavers could be easily obtained, but tne question arises, Is it more profitable, or, rather, is there less loss by allowing the looms to stand than by allowing a bad weaver to continue to weave?

"Wherever I have been employed, the fine system has been in force. I have never seen any scale of prices for bad work, and think if such were drawn up that the weavers would get acquainted with it and consider where they could let the greatest number of 'bad places' go and suffer the least number of fines. If, for instance, a fine of 3 cents per mispick or broken pick were imposed, it would be more profitable to the weaver, if he had woven six inches past it, to allow it to pass and suffer the fine than to pick out and remedy the defect. It is my opinion that every superintendent or boss weaver should take personal interest in the method of fines, because if the fines are not imposed judiciously and with the object of improving the weavers, rather than to recoup the full amount of the cost of mending for every piece, the boss weaver will find himself short of weavers, and what he has will be of the mediocre class.

"A good weaver who once in three months weaves a piece of cloth that is not up to the standard does not as a rule tolerate fines, and it is most likely the fault of the loom-fixer when such a piece is made. There are other weavers who do not consider the employer's interests whatever and if their pieces were allowed to pass, the employer would be obliged to go out of business eventually.

"In conclusion, would say that I do not believe in a recognized scale of prices for bad work in a small mill where the superintendent or boss weaver can supervise the examining of the pieces and prevent any unfairness in the imposition of fines. I think in the large mills where there are such scales each examiner should have so many weavers apportioned to him and that he should be held responsible for the work of such weavers and should use his jugment in imposing fines, as it would be to his credit if the best work were obtained from his section. Any unfairness could be reported to the boss weaver, who could look at the pieces in question or delegate some assistant to that work." Quaker.

LONG AND SHORT BOBBINS.

The discussion of this subject in the June number has created much interest and we have received a number of additional communications which are reprinted below.

28. From experience and from the pictures of the bobbins which illustrate the question, bobbin No. 7 seems to be the limit of length for advantageous work. Had a greater quantity of weft been wound on No. 7 to make the running time 18 minutes, a more satisfactory result would have been attained. The weft on No. 8 1/2 is far more likely to break than on No. 7. The short lengths of weft on broken bobbins, unless the weaver is experienced, more than offset any advantage gained by the use of the long bobbin. The shuttle travels at the rate of a quarter of a mile per minute; the weft draws off the bobbin at the rate of 2,700 coils per minute, which causes the weft, as the bobbin gets empty, to make one or more reverse coils on the bare part of the bobbin (according to the tension). This breaks the weft. The broken bobbin shows how the weft coils are loosened by the action until the weft finally breaks.

If No. 8 1/2 did result in making it possible for the weaver to run extra looms then the manufacturer is entitled to his share of the increased advantages. A loom supplied with weft to last 25 minutes is a decided advantage over a loom supplied to last 12 minutes, but if the 25 minutes is broken into 20 minutes and 5 minutes, then it is a disadvantage. There is plenty of margin to increase the amount of weft supplied to a shuttle two or three times without lengthening the bobbin. When the weft is spun on the bobbin direct it would hardly be available. In all cases where the weft is wound from hanks or spools it is available.

36. There can be no fixed rule on such things. If the material is extra thick, naturally longer bobbins are desirable; if it is reasonably fine, however, there is no particular advantage in long bobbins, and there may be a distinct disadvantage. The finer yarn is more expensive, and if anything happens to the bobbin, by which much of it is wasted, the percentage of the value of the waste would increase.

Another thing is the interchangeability of the work and material. For instance, it might on certain work be profitable to use very long shuttle bobbins, and yet on the bulk of the work in the same mills it might not be desirable to use such long ones. The fact of having some bobbins, shuttles and loom boxes, perhaps, of a different length than the others might be more than an offset to the advantage to be gained on that portion of the work where the longer bobbin would seem to be advantageous.

It goes without saying that if a mill were to run steadily on a certain fabric (of material of comparatively low cost), that the longer the shuttle can run without changing the greater the production and the less the waste, but there are very few mills whose production is one thing all the time. Matters of this kind can be determined only by the managers of each mill.

We do not believe that any reduction in wages can be effected by this difference in the shuttle bobbin, as it would not be sufficient in any event to cut much figure in the production.

30. Starting with the ring spinning frame, there is theoretically a saving in the time it takes to fill a set of the longer bobbins as the spinning frame will need doffing only once where it would be necessary to doff twice with the short bobbin. This means a saving of 50 per cent. in the doffing. In the weave room it takes a weaver not more than five seconds to refill her shuttle with a full bobbin and to change a shuttle is not more than three seconds work. We will allow ten seconds to fill and change shuttles, which gives the weaver two minutes out of ten hours' work for changing shuttles and filling them with 7-inch bobbins. I estimate a saving of six minutes in the day's work on a loom using the long bobbin.

The shorter the bobbin the more uniform is the tension of the filling during weaving. The filling motion is adjusted to suit a certain amount of tension on the filling. If the filling is very slack to start with it will not raise the fork on the stop motion and the

lever will not pass under the fork. Consequently the loom stops. This difficulty may be caused by the long bobbin, when full, giving less tension than is required. When half full the tension is suited to the filling stop motion. When the bobbin nears the end the strain is so great it is at the breaking point. The effect of this on the stop motion is to cause the filling fork to rebound. Sometimes it will catch the lever which ought to pass under the fork, causing the loom to stop when not necessary. The weaver may be eight looms away and have work there that will take one minute. She walks over to find out the cause of the loom stopping, finds nothing wrong and starts it again with her temper not improved by the incident. This may happen ten times a day on one loom. Does that weaver gain anything by the use of the long bobbin? This is only one of many difficulties in the day's work.

If the long bobbin causes the filling to break five times a day the weaver will lose time by the use of that bobbin. If the bobbin is nearly empty when the filling breaks, the weaver removes the broken bobbin from the shuttle and destroys the remainder of the yarn. If the rules are strict the manager will find a reduction of the visible waste and an increase in the invisible.

There are other objections to the long bobbin which I will not comment upon at this time as I wish to pass to the warp stop motion and see how much time is gained by it if any. Its merits as a device for making perfect goods are not questioned, but no manufacturer making plain cotton cloth can prove that it has increased the production of his looms. It is a success because it improves the goods and adds to the reputation of the mill.

I am not certain as to the extra time and labor required to adjust the different warp stop motions on starting a loom, but it takes extra time. On print goods or any kind of plain cotton a broken thread running for an inch or two will not cause an imperfection. If there are two or more threads out in one place an imperfection results. A weaver with her pickout comb can fix an imperfection of two or three threads out at one place so that an expert could not detect it. I am not advocating carelessness on the part of the weaver, but am showing that this class of goods does not call for the warp stop motion as it is a hindrance rather than a benefit to the weaver on piece work. It stops the loom when the end breaks; that is all. The weaver has to piece the thread and very often she will waste time in locating the broken end as it may break at the reed and leave no thrum at the end to show the weaver where the broken thread is out.

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31. I have made the same change as has been made in Fall River using an 8 1/2-inch bobbin in place of a 7-inch bobbin and find it is a great benefit to both the weaver and the manufacturer. In the first place, a weaver can look after more looms with the same amount of work. They do not have so many imperfections from changing the filling, and I do not find that the percentage of breakage is any greater than when using the smaller bobbin on this class of goods. The 7-inch bobbin holds 425 yards of filling; my new bobbin holds 710 yards, and I think it very successful.

When I came here the weavers were running two looms on linen and union towels and crashes, and were paid $5 per week. The production was about 275 yards per loom per week. About the first question put to me by our treasurer was whether I could change the work to a four loom job. I told him that I did not see any reason why it could not be done, and started to get things into shape.

I ordered some new 8 1/2-inch bobbins and shuttles to match, and put them on the very coarse linen. I changed my warps from single 10s to 2/20s, then I gave each weaver four looms, and put them on a piece-work basis. Instead of paying $5.00 per week for two looms, I paid 53 cents per 100 yards. Then I had a strike on my hands. The weavers stayed out two weeks, when a committee waited on our treasurer. We talked the matter over and persuaded them to come back and give the new system a trial. Ever since they have been averaging from $9.50 to $11.00 per week and the company has made a saving of about 32 cents per 100 yards.

32. There is a limit to the length of the bobbin that can be profitably used in weaving. What that limit is it is hard to determine but I should say about 7 1/2 inches. I have known of cases where 7 inches was too long because of the tendency of the bobbin to spring up during the running of the shuttle. The long bobbin adds great strain to the filling when weaving from the lower end, and Fig. 3 shows just such a bobbin as I should expect to see. The breaking of the yarn in such a manner would mean extra work for the weaver. There are, no doubt, some cases where the filling runs down to the bottom on the long bobbin, but these will be few. Even in such cases I should expect to see imperfect selvages. I should judge a longer shuttle would be required for the longer bobbin and the trouble from such shuttles will be evident to the mill man.

So far as I know of the circumstances I can hardly see anything to warrant a reduction when using the 8 1/2-inch bobbin.

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33. The advantages to the manufacturer in the use of the long bobbin in place of the short bobbin are many. Chief among them is the question of greater production on the spinning frame, with a consequent lowering of the cost per pound because less labor will be required to doff the frames. For instance, on the short bobbin there is about 8/10 of an ounce of yarn, or about 1550 to 1600 yards. A spinning frame on 36s running at a speed of 10,000 r. p. m. will turn off a pound per spindle, very often more, which means that the frame must be stopped at least twenty times during the week for doffing. For 50,000 spindles this causes a large loss in production, and means either a large number of doffers, or having the frames stopped sometimes until the doffers get around to them. Under normal conditions this loss of time would amount to two hours every week per spindle, or a loss in production through this cause of about 1700 pounds per week in a room of 50,000 spindles. On the other hand one of the new 8 1/2-inch bobbins will hold over double the amount of yarn that can be put on the old bobbin, thus giving 1 3/4 ounces per bobbin, and reducing the doffings to about nine per week, giving an increased production of 900 pounds of yarn, with a decrease in cost owing to the fact that only half the doffers are necessary in the room.

Then again, in the spooling department the help are usually paid by the hundred, and thus a saving can be made there, as only a trifle more will be paid for the long bobbins. The saving of time in spooling, along with the smaller number of knots, at once appeals to the reason of all thinking mill men.

Now for the weave room end. To begin with, the fact that a weaver has to thread a shuttle every minute on the old size bobbin, allowing for the filling breaking once on every second bobbin, along with the other work of a weaver, means that they are kept busy when running eight looms. This is irrespective of the injury to the health of the weavers from the constant breathing of the dust and cotton lint into their lungs. This changing of filling so often means loss of production in the weave room, besides the liability to have a poor quality of cloth owing to thin places and mispicks. All these troubles are reduced over one-half by the long bobbin and, therefore, the results must be advantageous to the manufacturer. Last, but not least, comes the question of waste, which is always in the mind of an up-to-date manufacturer. At times a mill superintendent will drive his overseers distracted by harping on the amount of waste; the result is a lower waste report, but a greater loss, owing to the waste being carried away or otherwise disposed of. The mill loses the value of the waste, which would otherwise be sold and the proceeds turned into the mill treasury. By the long bobbin this loss is reduced one-half and thus a large saving is made in this matter alone.

I have given a few of the advantages of the long bobbin to the manufacturer, and there are just as many reasons why the weavers should welcome its advent among them.

First, health. Anyone who has studied the question of the unhealthy method of threading a shuttle, will admit that anything that reduces the cause of such trouble is a boon to the weavers. We read of scores of patents for self threading shuttles being "applied for," but here is a change which reduces the cause one-half, and yet we are told

that the weavers are opposed to long bobbins. There is no more labor attached to the placing of a long bobbin in the shuttle than a short one. Thus the weaver not only gains in respect to the better sanitary conditions but she has only half the work of refilling the shuttles. As the time consumed in this operation is about half her work, it means that she can look after two more looms than with the old bobbins.

The only disadvantage that I can see to the weaver in running ten looms on the new bobbin as compared with eight on the old one is in the greater distance to be traveled in going backward and forward during the day. I think that the manufacturer should be willing to remunerate the weavers for this extra labor, and this brings us down to the second question as to what reduction, if any, should be made in the price list for weaving. Where a mill is paying 17 cents for the weaving of 50 yards of cloth, the weaver running eight looms and getting off six cuts per loom, thus earning $8.16 per week, it would be a fair proposition to reduce the price to 15 1/2 cents, thus enabling a weaver to earn $9.30 per week on ten looms. This would give the manufacturer a gain of nearly 10 cents per loom per week, which in a mill of 2,000 looms would mean about $200 per week, or $10,000 per year. This amount, along with the other saving in the spinning room, would amply repay the mill for the expense and trouble of providing the longer bobbins.

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37. I do not see any improvement in the long bobbin. In the first place the bobbin is so long that it has too much vibration, and the end of the spindle will not keep in line with the shuttle eye, thus causing more breakage of the filling. Another disadvantage is that the filling is so thick that when the yarn is running off the last half of the bobbin it is subjected to a great strain, particularly if the spindle is not true. This results in still more broken ends and an inferior piece of cloth, while the production is in no wise increased. If this long bobbin is to be made a success the filling must be made a little heavier so as to get more strength and the warp will have to be made finer to get the desired weight of cloth. This I do not consider wise. I like the warp to be as good and strong as I can get it, because if we have good warp yarn, free from stubs and knots, we stand a better chance of getting a good piece of cloth. If we have a weak warp yarn it is next to impossible to get a good sound cut on account of the excessive breakage.

Now if we are to adopt long bobbins and warp stop motions we shall demand a better and stronger yarn. I do not care if we use only the long bobbin. If the filling will not stand the extra strain on the last half of the long bobbin the loom belts will be on the loose pulleys, just as much with the short bobbin.

It is the same with the stop motion. Unless we have good clear yarn we are going to lose in production. If a thread breaks without a stop motion the loom will run for a time and, if not too long, it will not spoil the cloth. I do not condemn the stop motion. It is the best invention that has been put on the market for some time. No doubt our weavers will run ten looms on some classes of goods with the stop motion. On other grades they cannot do it. We who have had experience in the weave room know that quite a number of weavers do not need stop motions. They are right on their work and keep up with it, and we can't find fault with their cloth, for it is the same year in and year out. They do not know what it is to be called down. Other weavers are in trouble all the time. They don't seem to know right from wrong; they don't seem to have any idea about their work and it is for these few that we need the stop motion. If there is trouble with the weavers in regard to the stop motion we will find in nine cases out of ten, that it is with the weavers who couldn't keep up with their work before the stop motion was put on. They find if they don't get a move on they have looms stopped all the time.

There is a great difference in weavers. Some seem to have a very easy time of it and others are careless and at times worked almost to death. One weaver is all the time keeping an eye on the warp and filling, cutting off knots and catching the filling as it runs out thus making from $1.50 to $2.00

per week more than the one who lets all knots and everything else come along and doesn't notice them until they have a large break-out and stop the looms with a "D—— the work!" or "Why don't they give us better work? Let's strike." For such weavers the stop motion would be a great success.

GAMALIEL GAUNT.

Assuming that the spinning frame is on 36s yarn and a 7-inch bobbin; that it takes two hours and a half to fill a set; that the bobbin contains 1,560 yards of yarn; that the running time is 10 hours; the time required to doff the frame, three minutes, the frame will be doffed four times in 10 hours. This is equal to 12 minutes or six per cent. of the total running time. With the 8 1/2-inch bobbin carrying 3,309 yards, the time required to fill a set will be 5 hours and 30 minutes, making 1.84 doffs per day. Assuming that the time required to doff the frame with the 8 1/2-inch bobbin to be 3 1/2 minutes, 6.3 minutes per day will be consumed in doffing. The gain by using the long bobbin is consequently 5.7 minutes per day or about 1 per cent. of the running time.

Assuming the spinning wages with the 7-inch bobbin to be 1.10 cents per pound, the cost with the 8 1/2-inch bobbin will be 1.005 cents per pound. If one-half the doffers can be dispensed with, then the cost of doffing is .14 cent per pound. The gain on this item will be .7 cent, reducing the labor cost to .935 cent per pound, and making a total gain of .165 cent per pound.

A. FITTER.

ENGLISH NOTES.

(By our Special Correspondent.)

News that Americans are in the market for British and Irish wools has had a deterrent effect on the sale of these for home consumption. But topmakers are reputed to have booked very heavy orders recently for tops out of Colonial wool, and this despite heavy arrivals of new material and the definite impossibility of recouping existing rates out of yarn or pieces. These purchases are for German account, for Bradford resumes its old place at the tail of the procession. It may be good policy, or bad, to let other centres secure the best lots, but Bradford consumers decline in general to buy at prices which cannot be recovered. The guilt of raising to and maintaining at their present levels the prices of merino and crossbred is not the British manufacturers, America first and the Continent second are the instruments of the case.

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Passing attention is usually bestowed on this side to the various schemes evolved in the Southern States for the better marketing of cotton. One which, with variations, appears to be a favorite of reformers, relies on the grading, storing and certificating of bales by a guarantee corporation, so making it possible for spinners in Europe to buy directly. The theory is that English and other consumers would buy cotton warrants when they seemed cheap and lay away the securities until the mill needed the material. It would be well for the theorists to assure themselves that this probably would happen and to remember that the larger half of Lancashire mill companies have not the means to carry heavy raw stocks upon their backs and that perhaps still more of them lack the will to lose interest on their money. Attempts made in Manchester have proved the tremendous difficulty of establishing a cotton market for spinners in a new place, and it may be taken as a certainty that the competition of the Liverpool spot and futures market would remain formidable rivals for a very long time. Existing market arrangements are imperfect, but they are such as the trade has accommodated itself to, and no great change can be made without a certain degree of pain and difficulty.

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It will scarcely be news now to say that our unofficial Tariff Commission recommends Great Britain to admit raw cotton, cotton yarn and grey cloth free and to impose a duty not exceeding 10 per cent. upon all other cotton cloths and manufactures. This is something like an admission that protection would be of little direct service to cotton in the United Kingdom. As matters stand, we import only half as much manufactured cotton as the United States and export fourteen times more. The Commission

makes tacit recognition of the fact that cotton exports can only be extended on a large scale amid the people who dress in cotton and not all of these, by any means, inhabit British territory. Statistics tend to show that preferential rebates in British colonies have advanced the English cotton trade, and the Commission advocates seeking for preferential arrangements. Certainly the cotton trade with European countries is declining; that with American countries is at best stationary and the home trade absorbs only one-seventh of the annual production. We have to export over 80 per cent. of the output, so the reason for seeking to conserve and improve colonial trade is cogent.

It is more interesting to trace the possible (or probable?) effects of general protection upon the cotton trade indirectly, as has been done in some detail by the controllers of a large mill. The cost of the mill is some $325,000, of which $240,000 is represented by iron and steel work. A 10 per cent. increase in the cost of steel would mean $24,000 on the price of rebuilding, or an annual charge in depreciation and interest of $2,400. The small duty suggested on grains would add $500 per annum to the expenses of the sizing department. Ten per cent. on oils, leather and kindred consumable stores would mean $2,800, and to bleachers it would probably be needful to pay $2,500 more. Add to this a 5 per cent. advance in wages, or $4,750, and working expenses would be increased by some $13,000 a year. In other words, the mill would have to earn a further 12 1/2 per cent. on its share capital. Doubtless the calculation puts the case at its blackest, short of actual exaggeration, but the net argument of virtually all cotton-working England is that new burdens would be imposed on the industry without bringing any compensatory advantage. Cotton in England holds an exceptional place among the industries, and the contention that protection can do it no good is peculiarly hard to controvert.

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Mercerizing of yarns and fabrics is neither so profitable nor so plentiful a business as it was. Mercerized linings are still wanted, but the demand is poorer for dress warps and for men's wear cloths. It is understood that the net cost of mercerizing warps in the most favorable circumstances is now about one penny per pound. The lowest price heard of is 2 1/2 pence for the process, and four or five years ago the tariff for mercerizing and dyeing was one shilling. Today a good price for the two processes is seven pence.

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Successful practice in the centrifugal dyeing of cotton thread on caps, and in hanks packed solid, is now being made. So far as the needs of the woolen trade for cotton yarn is concerned, the difficulties may be said to have been surmounted. By the use of extraordinary power and hydro-extractors, a Huddersfield firm is now doing very even dyeing for the colored cotton weaving business. Although numerous other attempts in the same direction have failed, it seems proved that success without unwinding and opening out is possible.

* * *

The proportion of moisture in cotton yarns is no more a subject of unanimity in Germany than in Britain. At Aachen, Crefeld, Leipzig and most other testing houses, the 8 1/2 per cent. standard is approved. But at Chemnitz spinners assert their right to pass 9 1/2 per cent. moist yarn as dry. Before assenting to any diminution, Chemnitz people demand a standard of condition for raw cotton. It is said that from some of the more northerly and rainy of the cotton-growing States, raw material holding 19 per cent. of water is frequently received. If by international agreement an absolute standard were arranged, it is by no means certain that the prejudices of British cotton doublers against dry yarns would be finally removed.

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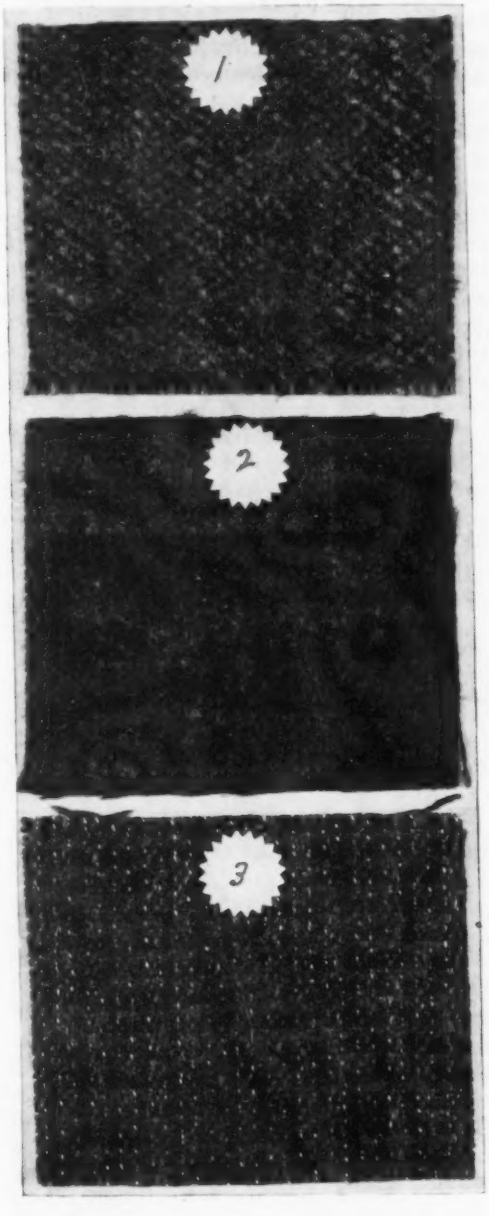
This summer sees a revival in dress silks. Dove and fawn poplins, chene prints and antique floral brocade effects, as well as plain goods, are fashionable. Silks have latterly earned a bad name among the multitude because of the excessive weighting that has been practised. There are people enough, however, with means sufficient to pay for more genuine articles, and an important difference to the silk trade would be effected if good silks held their natural place in all seasons.

A certain amount of disgust is expressed at Russia's tactics in Persia. To serve an ulterior, diplomatic end and incidentally to help



the Moscow and Lodz mills, the government subsidizes steamers and banks and lends money to native traders in the South. Well authenticated evidence shows that textiles are being put down in Persia at a dead loss of between 15 to 25 per cent. The State, not the Russian trader, bears the loss, and in these circumstances one cannot be surprised that Persians of dubious honesty and credit have placed large orders for forward delivery. English merchants on the spot are in revolt against the arbitrary enforcement of absurd customs regulations and are harassed by this buying of business. Hard to meet as such competition must be, there is always the possibility that Russia will find the struggle too expensive.

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Persian wools and Afghan wools are American and Russian purchases rather than British. It is the Joolgah or finer sort that comes to Liverpool, because the tariff hinders its sale at Boston. The Badghesi, or coarser and more colored sort of Persian, along with the dirtier Afghan, goes into American carpets. Meshed in the Khorassan district is the market for these wools, and thither about six million pounds are sold yearly. There are a spring clip, which is the longer, and an autumn clip, which is the cleaner, and these wools are collected in a somewhat extraordinary way. The merchant makes advances of money to men who contract to deliver specified quantities in specified times. The contractors agree to make 10 per cent. of colored and 10 per cent. of greasy wools the maximum of these sorts, and they go out into the wilds with caravans to bring back the material and complete their bargains.

* * *

In fine goods for men's wear the tendency is towards louder and more pronounced colors and checks. Lower goods are following the taste for stripes checked-over less distinctly. A style typical of many made for ladies' costumes, as well as for men, is done in woolen at 34 cents, 54 inches, 14-15 oz., and contains in all some 16 to 18 per cent. of cotton carded with the rest, Fig. 1. The region of Huddersfield is the local home of goods of this type and value. A stout warp containing a proportion of strong, but short, new wool, is the foundation of the fabric, which has an appreciably softer and weaker filling of pulled stock. The makers scour

their goods fairly well and hence avoid some of the trouble that has descended on Germans, who have sent here rubbishy woolens with a most intolerably evil odor. A crisp, firm handle is appreciated in goods of this sort.

A clever imitation of the Scottish style of dress tweeds has been produced in worsted by the H. B. Priestman Manufacturing Co. of Bradford. Tartan effects, Fig. 2, are produced out of two-fold crossbred yarn, in herring bone weave, about 26 picks each way to the inch. A grandrelle twist yarn, of gold and black or crimson and black, wrapped round a single thread of worsted, provides the over-checking, while alternate four and four of the green and blue or other combination, makes the mingled ground. The construction is sufficiently open to give a soft handle, and the sheer finish is not too sharp. In 43 to 44 inches the price is 36 cents. Taste is not unfavorable for the coming winter and the good colorist has an undeniable opportunity in putting together such goods as these.

An attractive cheap line by Hinchliffe & Gates, Bradford, costs 23 cents in 41 inches, Fig. 3. The filling is a hard woolen yarn, probably of Continental origin, and the warp of hard worsted in black and grey, enlivened with black and white cotton grandrelle. The filling alternates in twos of different colors, contributing something of a checkered appearance.

POINTS ON CARDING.

BY SAM DRIVER.

GRINDING.

Before proceeding to grind any cylinder examine it carefully and see if any teeth are out of place. Level the grinder and then set it almost to touch; then start the grinder and set very lightly on both sides until the wire has become smooth; then set up a little more until finished. Beginners should be careful in setting the grinder until they have acquired the art of grinding by practice. In grinding the cylinders no special time can be given. Grinding must always be controlled by sight, ear, and touch. The saddle is a good thing to knock out dirt and keep the wire smooth.

If the grinding is done lightly and carefully the top edges of the wire will be formed something like the cutting edge of a carpenter's chisel, but on account of the lateral motion of the grinder the side edges will be ground off, leaving nothing but the sharp points. On the other hand, if the grinding is done in a hasty or imperfect and careless manner, the points of wire are ground in a broader and coarser manner. Should the grinding be too heavy the pressure from the emery that this occasions will cause the points of wire to blister, making what is termed a hook. The card wire in this condition is detrimental to good carding and also prevents the cards from being stripped clean, increasing the amount of waste.

To attain the principal object in grinding it is necessary to grind slowly, lightly and carefully, with due regard to the quality and temper of the wire. Grinding too hard is like bearing on too hard when grinding a knife; it will turn the edge up. Grinding wire too hard turns the points down, forming a hook at the point of the wire. A good way to keep the cylinder sharp is to have an emery roll placed under the cylinder; this roll must run faster than the cylinder surface to keep it sharp. It can be driven from the fancy, but this plan has never been generally adopted.

A small roll covered with No. 8 emery or finer, placed on top of the first and second breaker doffer is a good thing to keep the doffers sharp and smooth and is used alternately with the dickey. The emery roll can be made to traverse by a little attachment put on the end of the shaft adapted for that purpose. A good plan when grinding cylinders is to have a spare worker or stripper covered with fancy wire placed on the top of the cylinder and set lightly in the cylinder when grinding. With careful setting there is no use in grinding the cylinder every month. It will run six months or a year or even more. On dirty stock the cylinder may need brushing out once or twice a week. To grind the fancy set it up to the grinder roll without any belt and allow it to run by pressure of the grinder holding the fancy by

friction. Run slow and steady or it may be ground untrue. Grind until all the creases are out.

STRIPPING CARDS.

Every card room should have one stripper to take the lead and he should have the stripper belt side of the card; pay him a little more and he will see that the cards are stripped properly and at the right time, the comb cleaned, the belts examined, and the poppet heads cleaned out every time the cards are stripped.

Every stripper should be furnished with a good oil can and oil the bearings after the card starts. The card should be well filled after stripping before putting up the drawing or roping; if not the roping will be fine.

It is well to avoid as far as possible all unnecessary stripping. A good many dollars can be saved in a year if good judgment is used. To strip the cards through every time except when changing colors is a waste of stock and a loss of time and labor. Strip only that which is dirty and when it is dirty. It pays to have good careful men for strippers.

BROKEN DRAWING ON BREAKERS.

There are many causes for the breaking of drawings. The doffer may be running too fast, in which case a reduction of speed would be to the advantage of the work and would also tend to increase the strength of the drawing. The doffer comb may have been striking and been worn rough or it may need cleaning. Drawing may also break by being stripped too far below the centre of the doffer. This may be remedied by raising the stroke of the comb.

Sometimes the drawing breaks down from too great a draft on the side drawing, in which case the end drawing will break as it leaves the doffer on the farthest end from the drawing rolls. Remedy: reduce the speed of the rolls. If the doffer gets dull, rough or out of true, the drawing will break down.

There are various ways of supporting the drawing as it passes to the rolls. On low stock it is a good idea to place a narrow apron under the comb, the same as for the Kershaw and Scotch feeds, and driven from the side drawing shaft. Sometimes the short and long stock is not blended and picked right; this often causes a breaking of the drawing. Too heavy a feed making the drawing heavier at times than at others may be the cause. The comb may be too high or too low, too fast or too slow. Have good stripper belts and keep them tight and clean. When the side drawing breaks down often extra work and waste result. Too much waste in the feed is another cause; also the stock getting too low or too high. If the drawing falls down raise the comb; if it pulls too tight, lower the comb. The centre of the stroke of the comb should be a little above the centre of the doffer. On long stock it is sometimes necessary to have a longer down stroke and on short stock a longer up stroke. Set the comb as close to the doffer as it can be and not strike, and keep the comb teeth free from grease.

All kinds of supports are used to keep the drawing from falling down, such as cone-shaped cylinders placed under the comb, wire and broom stick supports from floor to comb, small cone-shaped tin rollers placed on a board under the comb, and many other contrivances. If the stock is really too low and short to make good drawing it is best to bring the first and second breakers together and place a short endless slat apron between after the fashion of the Blamire feed.

THE APPERLY FEED.

In running the Apperly feed on second breaker and finisher the driving belts should be tight enough to prevent slipping; flyings should be kept off the belts. The leader-in and feed rolls should be kept in the best condition to insure even roping. The speed of a tumbler 9 inches in diameter should be 155 turns per minute, be covered with No. 34 steel wire and driven from a 48-diameter cylinder running 90 turns per minute. The speed of a leader-in 4 1/2 inches in diameter should be 165 turns per minute and clothed with No. 24 diamond point wire; when this clothing is put on great care should be taken not to bulge it. The top feed roll should be covered with No. 24 diamond point wire and the bottom feed roll with No. 22 wire.

Set the tumbler against the cylinder with a 28-gauge or even coarser; it is better than

to set too close and will give better roping. If any lumps should go through they will be more evenly distributed on the surface of the cylinder wire. To set the leader-in against the tumbler, put the belts all on and start up the finisher; then set the leader-in against the tumbler by ear. The leader-in and the tumbler should be set as close together as possible. Set the bottom feed roll first and as close to the leader-in as possible without striking; then put in the top and set the same. The centre of the feed rolls should be a little above the centre of the leader-in. The top feed roll must be set down close to the bottom to avoid lumps pulling in.

If the feed rolls run faster than the apron or the narrow feed worsted aprons it will cause the narrow side of the feed to draw from the wide side, making the roping fine on the wide side and heavy on the narrow side. Remedy: speed the aprons one or two teeth faster. This plan is better than setting the needle band at an angle of one inch from the bridge to the feed rolls on the wide side. On the long side of the feed have the waste end ring on the top doffer. Put very little twist in the drawing on coarse stock. A small roller placed between the leader-in and the tumbler with the points running toward the leader-in will divide the lumps and accomplish surprising results. There are no other carding points on the cylinder where this can be done except here on the leader-in and the tumbler.

The greatest care should be taken in packing the drawing or sliver on the feed table as a great deal depends on this in getting even roping. If packed too tight, lumpy and uneven roping will follow by the drawing bulging on the feed. If packed too loose, fine and heavy places in the roping will result.

The Apperly feed has three defects which have been practically overcome by talent and tact. First: this feed is inclined to make the roping finer on the wide side of the card than on the narrow side. There are several ways to remedy this. If an overhead rig is used incline it more to the wide side than to the narrow; this will cause the drawing to be slack on the wide side of the feed and therefore not so likely to draw in toward the centre. Another way is to set the needle band at an angle from the bridge to the feed rolls; this will give more weight of roping on the wide side. Still another way is to speed the girth feed aprons one tooth or more faster; do not alter the speed of the feed rolls, only the speed of the feed aprons. This will cause the drawing to pack tighter against the feed rolls and not draw toward the middle of the feed. Another way is to make the latch and the traveler separable by cutting the casting in two parts. Then move the part with gears and pulley that drives the traveler farther out of the latch, say two inches, thus putting on two inches more drawing past the latch than before the casting was cut. This puts more drawing on that side and makes the roping heavier.

Second: lumpy roping has been a serious trouble with the Apperly feed especially on short stock. To overcome this the leader-in should be in the best of condition and the points of the wire kept clean and sharp. The small fancy should be covered with No. 32 wire, and should be set 1/32 of an inch in the leader-in; set the fancy to the tumbler with a 28-gauge. The surface speed of the fancy must be faster than the leader-in and driven from the end of the last stripper. The feed rolls must be set down so the points of wire will mesh in one another, with the top feed roll and small wipe roll on top set as close to the leader-in as possible. A good plan is to run a stripper covered with No. 32 wire underneath and between the leader-in and the tumbler. The points running toward the cylinder should be run slow; this will divide the lump and make the roping smoother and more even. It can be driven from the end of the feed shaft to the shaft on the floor and then to the stripper. The drawing should be as soft and fine as it is possible to run it. Sometimes the nature of the stock has something to do with making lumps. On some kinds of stock the leader-in and the tumbler may want higher speed; when this is the case the carder must use his own judgment. The packing can be adjusted to any desired thickness by the feed gear on the end of the bottom doffer. Altering this does not change the weight of the roping.

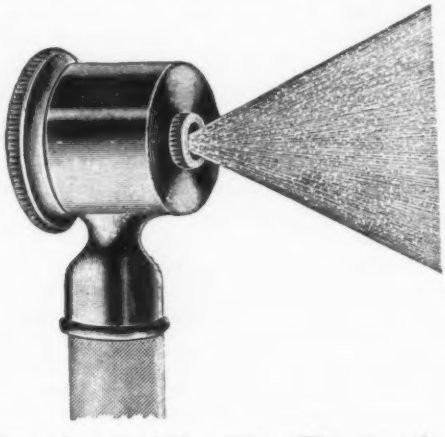
Third: when the tension on the drawing is too tight the feed is making uneven roping. If this is altered by running the traveler slower then the roping is made finer. The best way to alter it would be to speed up the second breaker doffer. If the drawing falls down from the overhead rig in the centre of the feed it will make the roping heavier in the middle of the card than on the sides, because the drawing is slacker in the middle. The drawing should drop eight inches nearer the wide side from the middle than from the narrow side. This will make the tension the same on the wide side as at the middle and narrow side. The plate under the bridge should be set down so that the two small rolls that the drawing runs through will be on the edge of the plate. These rolls should be cleaned and oiled at least once a week. The traveler rod should be kept well oiled by tying a piece of drawing on the rods between the traveler bearings and pouring oil on morning and noon. There are three places from which the traveler is driven: the back stripper, the cylinder and the leader-in. Either of these will do, but the belt must be tight. Driving from the cylinder is best when it can be done.

These are little things but very important in getting even roping and they are often neglected. If there are creels on the second breaker, which the writer prefers, the only thing is to keep all the drawings in. One drawing out will make the roping finer. By following these rules there is no reason why the Apperly feed cannot make reasonably even roping providing the Bramwell feed is working as it should. When the drawing breaks the feed will run some distance without any drawing, leaving an open space on the feed table. Then the boy comes along and takes the drawing and doubles it up and places it on the feed table haphazard and lets it run right along on the spools, making all kinds of uneven roping—coarse, fine and lumpy. Sometimes the spinners see the bad spools and sometimes they don't. If it don't bother them too much they are apt to let it go. The right way when the drawing breaks down is to let the bad feed run to waste until it has all run through the card. If on the second breaker, let it run until the drawing comes right; if on the finisher let it run until the roping comes right or the bad feed has all run through the card; then take out the spools and tear them up.

(To be continued.)

SPRAY BOX OR NOZZLE.

The small device shown in the accompanying illustration has been designed for the use of mill-owners as a spray producer for the conditioning of yarns, the dampening of manufactured goods, and in connection with ventilating plants, etc. It is a sort of nozzle, to be fixed to the end of a common water pipe, which may be flexible or otherwise. As the water passes through the nozzle under pressure, it flows out with a rotary motion in the



form of a conical spray. The centrifugal force exerted therein disperses the fluid over a wide area of space.

The fineness of the spray is governed by the bore of the nozzle and by the degree of pressure exerted in the supply pipe. For instance, although the small pressure of 15 lb. per square inch is sufficient to put the apparatus into action, it is worked to the greatest advantage when coupled to pipes obtaining their supply from towns' mains, or from other sources having sufficiently high pressures.

The simplicity of the device allows of its being put upon the market cheaply, so expense is no obstacle in the way of giving it a trial. As a Continental invention, it is extensively used abroad, and, from information we have received, is well liked by both spinners and manufacturers.—Textile Manufacturer.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Mill Construction.

Editor Textile World Record:

Does the term "mill construction" indicate any particular specification, or is it a general term?

Term (562).

Mill construction consists in so disposing the timber and plank in heavy solid masses as to expose the least number of corners or ignitible projections to fire, to the end also that when fire occurs it may be most readily reached by water from sprinklers or hose.

It consists in separating every floor from every other floor by incombustible stops, by automatic hatchways, by encasing stairways either in brick or other incombustible partitions, to the end that a fire shall be retarded in passing from floor to floor to the utmost that is consistent with the use of wood or any material in construction that is not absolutely fireproof; in guarding the ceilings over all specially hazardous stock or processes with plastering laid on wire lath, or upon dovetailed lath, following the lines of the ceiling and of the timbers without any interspaces between the plastering and the wood; or else in protecting ceilings over hazardous places with salamander, asbestos air cell board or sheet metal; in not only so constructing the mill, workshop or warehouse that fire shall pass as slowly as possible from one part of the building to another, but also in providing all suitable safeguards against fire; it consists in laying the top floor and an outer boarding of the roof over mortar, salamander or other heat retardent laid upon thick plank, where the maximum of safety is to be attained. Atkinson.

Mule and Frame Spindles in the United States

Editor Textile World Record:

What is the number of mule and frame spindles in the United States and how much cotton is required to supply them? Byron (548).

According to the United States census of 1900 there were 5,563,480 mule spindles and 13,444,872 ring frame spindles, which consumed 1,817,643,390 pounds of cotton.

Drying Filled Cotton Cloth.

Editor Textile World Record:

We are finishing filled shade cloth like the sample enclosed and wish to increase the capacity of our dryer. Our tenter frame is 100 feet long and the cloth is held in position by clamps attached to a traveling chain on either side. The frame is boxed in such a manner that there is an air space of about 9 inches in height above and 9 inches below the cloth for the free circulation of air. The width of the box is about 80 inches, permitting of drying goods 40 to 58 inches in width.

Our present method of drying is with hot air forced through the tenter frame from the delivery end, one-half of the hot air entering on top of the cloth and one-half entering underneath it, the cloth traveling in the opposite direction from the air. This air is heated with 4,200 feet of 1 1/4-inch steam coil, steam pressure 50 pounds. It is so piped that either live or exhaust steam may be used. The air is forced into the tenter frame with a large fan which draws the hot air from the coils, the air passing out of the tenter frame at the end where the cloth enters.

A roll of our goods containing 2,516 yards weighs when bleached and dry 319 pounds. This after being filled weighs 594 pounds. One lot of filling (75 gallons) which contains 45 gallons of water and 30 gallons of solid material, will fill about 1,000 yards of goods. We cannot give the weight of 100 yards of muslin after being filled and before it is dry, as the cloth goes direct from the filling machine to the tenter frame. Besides this there is a little moisture in the cloth, as it gets a very light sprinkling before being filled, but it would be quite impossible to determine the amount of moisture. The filling is made of clay, flour, starch, etc.

The temperature of the air where it enters the tenter frame, when using live steam, is about 170° F., and at the outlet or exhaust end is about 140° to 150°. Under test we find that the air as it leaves the frame has not become anywhere near saturated with moisture, that is, it does not carry anywhere near the amount of moisture it should absorb at 140°.

The enclosed sample shows the filling put on the cloth. The dryer works very satisfactorily, except that we would like to dry the goods faster than we have so far been able to do. About the best speed we have obtained so far is 14 linear yards per minute. We would like to bring it up to 25 yards. Sussex (537).

We have referred this inquiry to one who has made a special study of drying textile fabrics, and his reply is as follows:

There are many methods of using the heated air, such as blowing it through the cloth, superheating it by blowing it through coils directly under the moving cloth, etc., but I know of no better or more economical method than that used by Sussex. The fact that the air is not saturated with moisture as it leaves the box shows, however, that there is a gain in economy possible. I would suggest that he slow down his fan to a point where the air as it leaves the box is nearly saturated with moisture.

This should have the effect of increasing its temperature as it enters the box, so that the drying capacity of the smaller volume of air would be nearly as great as the large volume used before. The air would, however, be used more efficiently, and power would be saved at the fan.

To increase the drying capacity of the tenter, I would recommend using a can dryer or better a cell dryer at the delivery end, running the cloth directly from the tenter to the dryer. In operation the machine would be so speeded that the cloth may leave the tenter only partially dry, the drying being completed on the cans or cells. The cloth, would, however, be dry enough on the surface so that its appearance would not be injured in the least by its passing over cans or cells. It should easily be possible to increase the speed from 14 to 25 yards per minute. This sort of thing is being done, to my personal knowledge, on a great many tenters, and delicate as well as heavy goods are being satisfactorily dried at fairly fast speeds. The cell dryer is particularly well adapted for this work, as it is housed in, is small, occupies little floor space, has no stuffing boxes, buckets, etc., and is simple and easily kept in repair.

Fancy Yarn.

Editor Textile World Record:

We are making a 3-ply fancy yarn as follows: A single No. 8 worsted is run with a 2/20 cotton in the proportion of 57 inches of worsted to 30 inches of cotton. A single No. 16 cotton binder is then run on the 2-ply in the proportion of 37 inches of cotton binder to 30 inches of 2-ply. What is the weight of each kind of yarn in 1000 lbs. of the 3-ply? Whaler (515).

Taking any convenient length, say 300 cotton hanks, as a basis for the calculation the length of each kind of yarn is as follows:

1/8 worsted (5 1/3 cotton)	570 hanks.
2/20 cotton	300 hanks.
1/16 cotton	370 hanks.

The weight of each of these lengths is found by dividing length by cotton No.:

570 ÷ 5⅓ =	107 lbs. 1/8 worsted	66.8 per cent.
300 ÷ 10 =	30 lbs. 2/20 cotton	18.8 per cent.
370 ÷ 16 =	23 lbs. 1/16 cotton	14.4 per cent.
	160 lbs.	100 per cent.

The percentage of each by weight is found by dividing the respective weight by the total weight. Having thus found the proportion, the weight of each kind of yarn in a lot of any given size, say 1000 lbs., is easily found as follows:

1000 × .668 = 668 lbs. 1/8 worsted.
1000 × .188 = 188 lbs. 2/20 cotton.
1000 × .144 = 144 lbs. 1/16 cotton.

Bleaching Sewing Thread.

Editor Textile World Record:

Our sewing thread, when the thread runs off the spools after bleaching, will run for a few yards and then snap just as though it had been tendered in one small spot; then probably it will run for 100 feet and break again. What is the trouble?

Orizaba (522).

If Orizaba will subject any part of the sewing thread to a tension sufficient actually to stretch the thread, he can readily determine whether the elasticity has been seriously impaired by the bleaching process or not. If the thread will stretch under tension and then regain its normal length, this would indicate that the trouble is not to be attributed to the ordinary bleaching process. On the other hand if the thread will allow of no stretch whatever, it would indicate that the yarn had been tendered to that extent in the bleaching process. If the thread shows distinctly that it retains its normal elasticity, but snaps off at irregular intervals, the trouble may be due to hanging or storing the thread where small particles of bleaching powder are carried by currents of air and deposited on the thread; this would eventually cause tendering of the material. However, it is difficult to determine just how or where the trouble originates without being on the spot to investigate more closely. Palmetto.

Recent Cotton Crops.

Editor Textile World Record:

Will you kindly furnish us with information as to the number of bales in the cotton crop for the United States for the years 1900 to 1904, both inclusive?

Zion City (570).

1900-1901	10,339,000 commercial bales
1901-1902	10,768,000 commercial bales
1902-1903	10,674,000 commercial bales
1903-1904	10,002,000 commercial bales

Dry Waterproofing Process.

Editor Textile World Record:

Is there a dry waterproofing process besides the Ceillette, and if so what firms make use of such process? Bavaria (566).

Strength of Ramie Rope.

Editor Textile World Record:

What is the average strength of rope made from ramie for transferring power?

Horse Power (549).

A French manufacturer of ramie advertises his rope for power transmission as being capable of resisting 14,000 pounds per square inch.

Oiling and Cleaning in Cotton Weave Rooms.

Editor Textile World Record:

What is the usual method for oiling and cleaning weaving machinery? Is it done by the weavers or by special help employed for that purpose?

Perry (569).

In mills where plain looms are used it is customary for the weavers to do their own cleaning and oiling. On fancy work or on jacquards or on Draper looms, or where warp stop motions have been installed and the weavers are required to look after a large number of looms, the oiling and cleaning is usually done by men or boys hired for that special purpose.

From Manchester, N. H., a correspondent writes: "In all the mills in this city the weavers do their own cleaning and oiling."

From Rhode Island: "In these mills the weavers do the cleaning and oiling, but special help is employed to clean and oil the jacquard heads, which are over the tops of the looms."

From Massachusetts: "In all the mills in which I have worked it is usual for weavers to oil their looms once a week, generally on Monday. They have to clean their own looms and are generally allowed an hour on Saturday morning for that purpose. When they are on piece work many of them clean the looms during the noon hour on Friday. The exceptions to this are where Draper looms are used or where stop motions have been installed. In such cases men or boys go around early in the week and do the oiling and in the latter part of the week do the cleaning."

From a Connecticut overseer: "I have been an overseer in three mills and in all of them the weavers did their own cleaning and oiling. In some mills where they have the Draper looms special help is hired for this purpose. In fancy mills the fixers have done the oiling and I think this is the best plan as quite a good deal is saved in oil cans and oil. A good many weavers think their looms won't run well unless they have as much oil on the floor as on the loom. Cleaners are not necessary where the weavers run only from two to eight looms. I have been in the weave room for thirty years and always did my own cleaning."

From a Massachusetts mill: "When the weavers run four, six or eight looms each they have to clean and oil their own looms. I find it much better to have them do so as they are more interested in their own looms than a cleaner would be, the latter being cheap help earning about $5.00 per week. On Draper looms one man cleans and oils 208 looms. A number of our looms are equipped with electric stop motions and one man cleans and oils 150 of these. My weavers on Draper looms run from 16 to 20; on the looms with electric stop motions they run from 10 to 12."

From a New Bedford mill: "On fancy work with dobby heads our weavers run four, five and six looms and do their own cleaning, oiling and sweeping. The weavers on the jacquard looms clean, oil and sweep with a boy to oil and clean the heads over the looms. On plain work on the Northrop loom our weavers run 16 looms and have a boy to clean, oil and sweep for each 104 looms."

From a sheeting mill: "The weavers clean and oil their own looms and do their own sweeping. It has always been so in all the cotton mills where I have worked. We keep a chore hand to do the sweeping and scrubbing of the spare floor and to separate the waste, that is, to take the clean waste from the dirty, so it can be more readily graded in the waste house. He also looks after the weavers' oil cans and sees that they are kept full and in good condition. After twenty years of more or less experimenting I have found that this way gives the best satisfaction to the office and the help."

Fuller's Earth.

Editor Textile World Record:

We would like to know what mills use Fuller's earth in quantity. Connecticut (513).

But little Fuller's earth is used at the present time. Some mills, particularly those on kerseys, use a very small quantity for scouring and rinsing their goods.

Irregular Woolen Goods.

Editor Textile World Record:

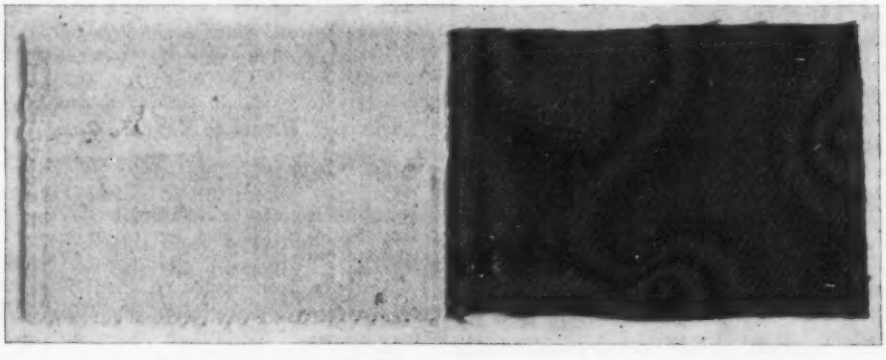
We are receiving numerous complaints from our customers who insist that because some of their friezes and meltons do not lay flat on their cutting tables that they are unevenly sponged by us. This we know is not the case as we steam them several times and by every known method of sponging and still cannot overcome this. Please tell us what is the cause of this and how to overcome it. At present we have a piece of Oxford, style 55, of which 18 inches in the width of the entire piece lies perfectly flat and tight, while the other 36 inches is loose and full. All these goods are sponged in the open width. Donelson (518).

The difficulty with Donelson's goods is probably due to irregular warping of the yarn, by which one or more sections of the warp are slacker than others. Whether this is the correct explanation can be readily determined in the mill by measuring the width of the slack and tight portions of the piece, and then ascertaining whether such divisions correspond with any possible divisions of the warping sections.

Curled Selvages.

Editor Textile World Record:

Can you suggest a remedy that will help us to overcome the difficulty of curled selvages in 3 and 4-leaf drills? We enclose samples of the 4-leaf twill cloth, showing the goods and selvages before and after finishing. As the goods leave the mill the selvages lay out perfectly flat, but the finisher claims that as soon as they are wet the selvages curl, making it almost impossible to finish the goods. Our yarns are standard twist and the filling is laid into the cloth without any extra tension in the shuttles. Lincoln (553).



One of the greatest troubles in a dyehouse or bleachery is curly selvages, that is, cloth on which the selvages begin to curl as soon as it is wet and before the dyevat is reached, resulting in the under part of the curl not being dyed, and creating an endless amount of complaint because it is practically impossible to straighten them out again.

In looking at the gray sample it is at once apparent that the selvage is too narrow and not properly drawn in. Only six threads are used for each selvage, and these are drawn in two in an eye in the twill weave, making what is known as a wire edge, and it is almost impossible to keep such selvages from curling.

The Textile Finishing Machinery Co., 17 Exchange Place, Providence, R. I., build a machine through which the cloth is run just before reaching the dry cans in order to straighten out the edges of the goods. This machine consists of two brass rolls, geared together and running in opposite directions, and grooved in such a manner as to make it impossible for these curly edges to get past. Scrimp bars are also used in this way with some success, when the selvages are not too narrow. In some mills where the cloth has two runs in the process of dyeing, the difficulty is sometimes met by running the cloth face downward on the first run and face upward on the second run, but this attempt to prevent the curling is only successful in mild cases.

The best and about the only way to keep out these curly edges is to go back to the weave room and make what is known as a tape selvage. This is done by means of a plain weave (one up and one down). In mills where the looms are equipped for only four harness work an attachment can easily be applied to supply the two harnesses necessary for the selvages, without interfering with the arrangement of the cams for a twill weave. In making this tape selvage the filling is looped at the bottom, and not at the top, as is the case with the samples referred to. Gloucester.

The curly selvage trouble is a very common one, especially in twilled cloth where plain selvages are most desired. The cause is, in great measure, conditional, and a close study of the draught, loom and filling is necessary to locate the remedy. By examining the two samples I should think the filling and draught were at fault. The selvage is drawn in cordy. If the warp is strong enough, draw every thread in warp single; if not, then draw six to eight double threads in harness and reed, straight draw. If warp reeds do not fill up the whole reed, leave most spare reeds at filling motion side. If the cloth is woven 3/1, set harness cams three inches from fell of the cloth, and if 1/3, two inches will be about right. If curled selvage is on filling motion side, notice carefully the weight of the fork. Do not use too much friction in the shuttles. Do not put more turns of twist in the filling than 3 to 3.15 times the square root of count. When using cop filling a straight shuttle eye will sometimes remedy the trouble. I have seen the trouble stopped by dropping the back whip roll.

Shandon.

All selvages that are drawn in similar to the sample enclosed have a tendency to curl. There is a thick ridge, particularly on one side, caused by the peculiar manner of drawing in the threads. Two

doubles lie under the others and make a double selvage which can be overcome by straight drawing in. On drills coarse threads must be avoided. When the cloth becomes wet these threads have a tendency to draw and cause the selvage to curl. By coarse threads I mean individual threads that are very prominent, forming a ridge. I have overcome this fault by drawing in an occasional single thread near the outer edge of the selvage.

Will Nelson.

From the samples submitted I should say the selvage was not strong enough and that the threads were drawn in wrong. You do not say whether a twill or a plain selvage is required and therefore I am somewhat at a loss what to say. I have woven something similar, 108 by 48, 12 1/2 yarn and 15s filling with only one double thread for the selvage and I never had any trouble with the selvages. I have had sateens curl at the selvage and the only way I could remedy that was by skipping a dent between the body and the selvage, then drawing in a dent and skipping another and so on. I should recommend this method if a good selvage is required.

Dan Ready.

The only complete remedy for the trouble found in finishing four-leaf drills is to have a plain selvage put on both sides of the cloth. As the cloth is now woven, the outside end on the selvage is woven in by the filling every fourth pick, while once in four picks there are three ends that are on the outside of the selvage and which do not interlace the filling, thus making a very ragged and loose selvage. Owing to the construction being heavier in the warp than in the filling the natural tendency of the cloth when placed in water is to shrink. The cloth curls toward the back because of the open character of the weave on that side.

If the cloth is examined under the microscope it will be noticed that the selvage ends are all crowded together. When the outside end is crossed by the filling it is pulled over the next three ends, and the shrinkage of the filling when wet is sufficient to cause the rolling of the selvage to continue. When it gets a start there is no means, short of a tentering machine, to keep it straight.

By using selvage motions the selvage ends can be made to interlace the filling in plain weave order. This will also permit the selvage harness to be set so that the filling will be engaged and held by the warp while it is being brought up by the lay, and still be able to set the beat-up of the body of the cloth wherever it is best for weaving. In the July, 1902, issue of the Textile World, I gave a description of a very good selvage motion. If it is desired to avoid using this attachment the selvage could be improved by drawing in the selvage threads on the first and third harnesses only, which would make the selvage weave with a plain intersection. By this arrangement every other pick would not be woven in the selvage, but would be drawn to the body of the cloth. The improvement from this change would consist in the fact that when the filling was woven into the selvage every other end would be up or down and thus give double the number of intersections. This would prevent the shuttle from causing the selvage to roll, which is the first and real cause of the selvage rolling when being finished.

Arthur Dyson.

Bleached Yarn on Cops.

Editor Textile World Record:

Can you inform me if bleached yarn on cops ready for use can be obtained in this country from sizes 8s to 12s singles, wound on paper tubes or wooden butts? Velvet (561).

We have been unable to learn of any spinners or bleachers for the trade who furnish bleached yarn on cops. It has been attempted a great many times, but we believe has not proved commercially successful. It is done abroad to some extent. In this country it may be done by manufacturers who have their own dyeing and bleaching establishment in connection with their own weaving. We should be pleased to learn of any spinners or dyers and bleachers who furnish it for the trade.

Japanese Wax.

Editor Textile World Record:

What is Japanese wax, and to what extent is it used in the textile industry? Port Arthur (510).

This question is answered by the following extract from Monie, "Sizing Ingredients":

Japan wax, often wrongly called bees' wax, is the product derived from an indigenous Japanese tree. It is a hard solid substance with a high melting point—about 120 deg. F.—and specially useful as a softening agent. In combination with castor oil its value is increased, and probably no other softeners can yield an effect so satisfactory. The use of this wax, however, is not very general owing to its comparatively high price.

Needle Felting Machine.

Editor Textile World Record:

In further answer to the inquiry in your May issue about builders of the machine for stitching a fibrous lap on a woven cloth face for horse blankets, we would say that the James Hunter Machine Co., North Adams, Mass., also build machines for this purpose.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The season for placing underwear orders for spring of 1906 with manufacturers is now at its height and is being rapidly pushed forward. There are a great many buyers in the market and they are placing orders in a liberal manner.

In the main the season just past has not been an altogether successful one and several jobbers are complaining that they are carrying over quite a quantity of spring underwear. Some few state they have had an extra good season, but the majority of them do not make such statements. The weather has been backward and unfavorable for the marketing of light-weight goods and in some instances heavy losses have been taken in order to clean up stocks.

A number of additional lines have been opened since the date of our last issue and now all lines are being, or have been shown. It may surprise some of our readers when we say "have been shown," but investigation shows that several lines have already been withdrawn, manufacturers stating they have sold their output for the season. Prices are low and on a stable basis and there is no opportunity for price cutting by any manufacturers who are inclined to get a living profit. The upward tendency of cotton and yarns has had the effect of causing buyers to hasten their purchases during the last three weeks.

Indications are that the supply of men's balbriggans at $1.75 to $1.90 will not be as plentiful as last year. Manufacturers have certainly not made any money in making this class of goods and several makers who have heretofore enjoyed a large bulk of this end of the business are now giving their attention to the making of 50c. and $1.00 grades; especial attention being given to the fine gauge lisles, Swiss ribbed gauzes and summer weight worsteds.

The Canasawacta Knitting Co. are showing a line of men's ribbed goods in blue, ecru, salmon and tan with double seated drawers at $1.80; also 4 1/2 lb. balbriggans with double seated drawers at the same price.

E. I. Goodrich is showing a men's combed balbriggan weighing 5 3/4 lbs. at $3.25. The shirt is made with hem tail and the drawer has double seat and extension strap back, and it is reported that some large orders have been placed on this number. This same firm is showing a line of men's fancy goods made by the Oswego Knitting Co. in fancy lace stitches at from $3.25 to $3.50 and buyers are taking same very freely. It is noticed that on each sample ticket of this mill's goods is the following printed statement: "These styles are special and will not be sold to any but legitimate jobbing trade." We suppose that this has been brought about by the recent discussion among knit goods manufacturers of selling through the so-called mill agents, to which objection has been raised by some of the large jobbing trade. We believe, however, that this discussion will have little effect on this business. It may be possible that some of the manufacturers who sold them this season will not take their business another year, but there will be some other manufacturer who has not sold his product in the month of January and will not throw over their shoulders the kind of orders that these people can place. It is reported that one of these "mill agents" states that he wants nothing better as an aid to help him sell his merchandise than the printed statements made by some of these jobbers. He claims that the fact that his competition has hurt the jobber is one of the best arguments he can put forth to sell his goods and he will take chances that he can procure all the merchandise that he can sell.

The La Tosca Knitting Co. are showing a very handsome line of ladies' shaped lisle vests and pants at $3.25 and also the "Just-right" patented combination suit at $3.62 1/2, a reduction of 12 1/2 c. from last year's price.

It is reported that the Morris Mills Co. have sold up their production of men's low-priced ribbed shirts and drawers at $1.80, five cents per dozen less than last year's price. They also sold the same garment with colored striped collarette and sateen front on the shirt at 2 1/2c. addition, and it is understood that most of the orders were taken on the new trim.

Robert MacKinnon & Co. are showing a 4-lb. men's balbriggan at $1.70; 5-lb. at $1.85; 5 1/4-lb. with rib tail at $1.95, with double seated drawer at 10c. additional. This concern has made a new departure this season and is making a line of fancy mixed goods weighing 5 lbs. on size 40 at $1.90.

Wm. H. Rowe & Son are showing 4 1/2-lb. balbriggans at $1.72 1/2 made by Gardner & Waring. The same may be had with rib tail and double seated drawer at 10c. per dozen additional.

Mr. J. K. Stewart has been showing men's 4-lb. balbriggans at $1.65, with double seated drawers; 5-lb. rib tail shirts at $1.77 1/2, and with double seated drawer at $1.87 1/2; 6-lb. rib tail balbriggans at $1.90, with double seated drawer with three button outside band at $2.05. This manufacturer now reports that he is sold up and has withdrawn his samples.

It is intimated that the withdrawal of some lines is not so much on account of being sold up, but because they show no profit at the prices being asked. Cotton is now hugging the 9c. mark, and with prices of merchandise based on cotton at 7 1/2 to 8c., it is easy to figure what will happen, unless some change takes place. Indications of a general advance are prevalent and as a preliminary some agents have been instructed by their manufacturers to take orders for only limited quantities at present prices.

Buyers now in the market are exhibiting some interest on duplicates of fall weights. They find they are obliged to pay advances on some lines of wool goods, and as these advances have a substantial foundation, it is up to the buyers to pay them or do without the goods. On fleeces and ribbed goods no actual advances have been obtained as yet, but anything in the way of concessions is out of the question and it only needs a continuation of the strong raw material conditions to advance men's fleeces to a $3.37 1/2 basis, and ladies' ribbed goods to $1.90 for seven pounds.

HOSIERY.

The 1906 spring hosiery market is open in all lines and most buyers are in the mood to operate liberally. Several of these buyers have just returned from Chemnitz where they found prices strong and the indications are that manufacturers will have a quick selling up season. Agents have made their initial trips, which has given the buyers an opportunity to get posted, and now, with the strong conditions existing in raw materials, should result in the rapid placing of orders on the books.

Buyers are showing faith in laces for 1906, and anything that has been shown in the way of new patterns has been picked up readily.

At retail counters at the present time, white hose has a large call in both lace and plain stitches, and also lace with self embroidery. These are hard to procure.

Tans are in good demand, but stocks are more liberal, and it is not a difficult matter to get anything in the way of tan hose as wanted.

Black laces and fine gauze hose are moving well, but plain black goods of serviceable weight are slow. Embroidered goods in small, neat patterns continue in favor, and indications are good on this line for another season.

Fall lines are well conditioned and several large producers are not in a position to accept any orders, as their machinery is all taken up for several months.

Some smaller manufacturers are open for orders for October delivery and are taking them at the old prices. This seems unnecessary, in view of the well sold up condition of the large makers and of the raw cotton conditions, and it seems as if a slight advance would not only be advisable for the interest of the manufacturer, but it would strengthen the market for advances on spring goods, which it may be necessary to ask.

KNIT BLOUSES.

At this time every season comes a query as to the extension of popularity of the knit

blouses. Inquiry reveals the fact that advance orders on this class of merchandise has not been quite as large as last year. This is accounted for by the feeling among buyers that styles may change suddenly and for this reason put off placing orders until their visit to the market.

The most important feature of the blouse is the style of the sleeve and the general impression is that the bishop sleeve will have the call, the leg o'mutton being too bulky to wear under the coat.

In regard to colors, white is as usual the staple, with brown and grey in good demand and an increasing tendency toward scarlet. $18.00, $24.00 and $30.00 are the popular prices at which these goods are being offered.

THE KINSEY PATENT PRESSER

BY LAFAYETTE.

This needle presser wheel is made specially for spring needle circular knitting machines and provides a presser wheel which is capable of being changed by its movable blades so as to make an unlimited number of fancy knitting designs. The ordinary needle presser wheel is cut specially for each design or pattern and is adapted for no other. Every new design requires another set of needle presser wheels to be cut accordingly. In a large mill making fancy designs the expense for newly cut presser wheels every time a change of design is required is considerable. The Kinsey presser wheel obviates this necessity and expense and furnishes a wheel which can be changed and set in a few minutes to produce an unlimited number of designs.

The presser wheel is made with a number of radially arranged slots in the rim of the wheel, which is provided with movable and adjustable blades fitting into the slots. These movable blades when thus fitted close the beards of the needles and form a plain stitch, whereas those slots into which no movable blades are fitted do not press the beards of the needles and a tuck stitch is formed.

The movable blades when fitted into the slots correspond to the small indentations or cuts in the presser wheel and the slots into which no blades are fitted correspond to the deep cuts. If all the slots are fitted with the movable blades a revolving needle presser for plain work is obtained. If every alternate slot is fitted then a presser wheel capable of making alternate plain and tuck stitches or one-and-one is obtained.

Assuming that the presser wheel contains 108 slots, any combination of plain and tuck stitches which can be divided into this number can be furnished. Thus: 2 and 2, 3 and 3, 4 and 2, 1 and 2, 1 and 3, 1 and 5, 8 and 1, 11 and 1, 10 and 2, and so on.

This wheel can be used for ordinary plain work or for plain and tuck work combined, as well as for fancy knitting designs which are produced by a combination of plain and tuck stitches. The presser wheel is operated in the ordinary manner, the same as those which are specially cut, and without any change of position in relation to the needles. It is so constructed that by removing some of the blades the wheel in rotation will skip

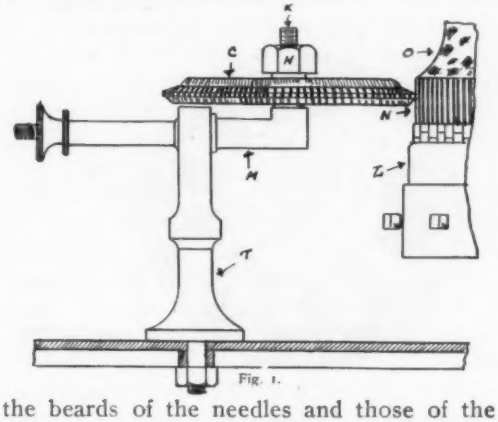


Fig. 1.

the beards of the needles and those of the blades not removed will close the beards of the other needles, thus producing tuck and plain stitches respectively. This needle presser will do the same work as all other needle pressers without additional mechanism to operate it.

Assuming that the presser wheel contains 108 slots ($12 \times 9 = 108$) with one wheel, designs can be drawn that will be 12 stitches wide and 9 loops or courses long. By using, say, 3 pressers or 6 feeds on the machine designs contained in 36 stitches wide and 9 loops long ($36 \times 3 = 108$) the second and third presser being set to follow each other thus making 36 by 9. Thus by using one, two or more of the pressers on the machine

and in the combinations of figures contained in 108 without a remainder an indefinite number of designs can be produced.

Fig. 1 shows the presser wheel set up and applied to a spring needle knitting machine. Fig. 2 is a central section taken through the body part of the wheel, showing the cap and nut which secures the blades in place within the body part. Fig. 3 shows one of the blades as removed from the wheel. Fig. 4 is a perspective view of the presser wheel with the cap and nut removed and shows some of the movable blades fitted in and some removed, leaving only the slots.

Fig. 4, A, is the body part of the presser

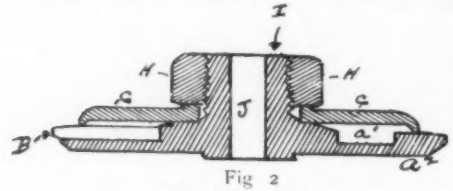


Fig 2

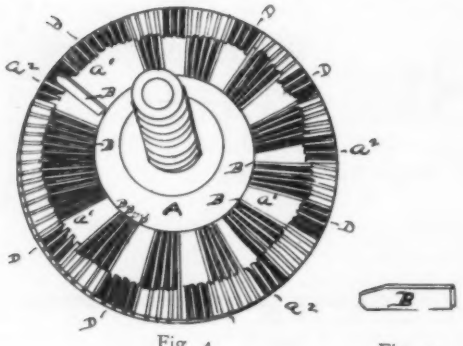


Fig 4.

Fig 3.

wheel, which is hollowed between the centre shaft passage and the outer rim as indicated at A^1, so as to leave a thicker part, A^2, at the rim. D indicates slots that are formed in the outer edge of the body part at right angles to the face of the rim. These slots are radially extended toward the vertical bearing, the slots where thus radially extended inwardly being formed in the thicker portion, A^2.

As thus made those slots in the rim of the wheel are on a line parallel to the axis of the wheel and are made wide enough for the needles of the machine to pass through without pressing the beards of the needles. B shows the blades that are made to fill the slots. These are arranged when in the slots so as not to pass outwardly beyond the rim. Thus the outer ends of the blades with the parts of the rim between the slots form a continuous surface where they follow each other in succession in the slots and in this position they press the beards of the needles.

C, Fig. 2, shows a central vertical section of the cap that covers the blades, B. This cap is secured in such position as to retain the blades by a nut, H, which is threaded and screwed on the hub, I, of the wheel. This hub is provided with an opening, J, for the shaft, K, Fig. 1. T, Fig. 1, shows the standard which supports the arm, M, to which the shaft, K, is attached and upon which the presser wheel revolves by contact with the needles of the machine. N, Fig. 1, shows the needles of the machine; L, the cylinder, and O, the web or fabric.

Thus any of the blades can be removed from the wheel and the slots left open, or the blades can be inserted into open slots and thus close any of the radial slots formed in the wheel. When the blades are removed from the slots the latter will admit the needles without closing the beards and where the blades are put into the slots they will press or close the beards.

KNITTING BLACK WORSTED YARNS.

Editor Textile World Record:

We are knitting a good deal of 2/36s worsted, but we get a good many seconds when working in black. The black dye seems to make the yarn stick to the needles. By running the yarn over an oily rag we find that it helps matters, but we do not like to do this on account of the oily odor and the saturation of the boxes in which the goods are packed. Can you help us out of the difficulty?

South (573).

A manufacturer who has had much experience in knitting hosiery from worsted yarn makes the following suggestion:

"I think the trouble is caused by the dyeing. It seems to me as if the yarn was overloaded with dye, or it is possible, in case it is Bradford spun yarn, that the oil was not properly removed from the yarn before dyeing. This oil coming in contact with the acid may have formed a gummy substance which stiffens the yarn. Without seeing a sample it is difficult to say just what the cause is. A microscopical examination would undoubtedly reveal it.

"I would suggest that a small skein of yarn be boiled in pure rain water for about fifteen minutes. If the surplus matter is removed it can be thoroughly dried and made to work right. If this does not prove a remedy, add a little soap to the boiling water, and if it still remains stiff it may be necessary to strip the color entirely and re-dye it. B. T. S."

Our old correspondent, Nantucket, to whom this question was submitted, says:

"If South is knitting black worsted yarn direct from the cone perhaps that may cause the trouble. I have found that woolen or worsted yarn when dyed black does not wind freely from the cone; the fibres seem to entwine. I have always rewound worsted yarn on to bobbins, having the tension just sufficient to make a perfect bobbin and permit the yarn to unwind freely. If oil is used it should be the highest grade of stainless oil, and should be used sparingly. First wrap the thread guides with a fine gauge piece of combed Egyptian knit cloth, and put on just enough oil to dampen the cloth, and occasionally add a few drops to keep the cloth damp, but no more. This will give no odor to the goods nor stain them.

"I have used both methods, but prefer rewinding and knitting from the bobbin instead of the cone. If there should still be difficulty in knitting the yarn, I use the oil, but always buy the best quality of stainless oil.

"Nantucket."

HIGH GRADE UNDERWEAR.

BY WABASH.

There is no reason why American mills can not make underwear equal to the imported article. As good carding is essential to perfect knit goods it will be well not to run the cards at very high speed. Many have an idea that because they use good stock they can speed up the cards. Well, they can, but it will be at the expense of the appearance of the goods if they go too far. The limit should be the point at which they can get good smooth round roving. The yarn should be spun with the left hand twist, care being taken to make the roving so that the spinner does not have to draw the yarn too far to get the weight required.

To make elastic soft feeling goods of 12 pounds weight per dozen, an 18-gauge machine is coarse enough; yarn to be about 3 1/4 runs and twisted as soft as practicable. Measure the stitch about three inches above the spreader and set it at 24 stitches to the inch.

To make goods weighing 13 pounds or over, a 16-gauge machine will be necessary with 2 5/8 run yarn, 20 stitches to the inch. It may be necessary to vary the size of the yarn as the shrinkage varies with the grade, but the sizes given will be found correct for wools of good quality and fairly clean.

The yarn should be moistened before knitting as this gives the cloth a much smoother appearance than when knit dry, but the cloth should be dry before being cut. Plenty of allowance should always be made for the shrinkage of goods in width and length, as the most common fault with wool underwear is the shrinkage after being washed. A size 40 shirt should measure when finished 32 inches in length. If made with rib border cut the goods 40 inches long; if made hem finished, 42 inches long. These measurements are for all wool goods. For 18-gauge goods, size 40 shirts are cut from 20-inch cylinder; for 16-gauge, 19-inch cylinder. This will allow the goods to shrink and still be large enough to fit the boards without stretching. To be non-shrinking they should be full length when put on the drying boards without having to be stretched or pulled down. For goods with more or less cotton in the mix these lengths would have to be shortened according to grade.

To wash high grade goods use an olive potash soap. The scouring soap should be made with 75 pounds of olive soap and 25 pounds of potash. For fulling use 90 pounds of soap and 10 pounds of potash. The goods should be first wet thoroughly with water at 120 degrees F. Start the fulling mill and put on enough soap at 120 degrees to make a good lather. Scour for ten minutes, stop the mill and run off the suds. Turn on water, start the mill and rinse for about two minutes to remove most of the scouring soap. Let the water run off and put on enough fulling soap to make a good lather. The wool will be softened and the goods improved in appear-

ance if one pint of liquid ammonia is added to 100 pounds of goods. The amount of soap required depends very much upon the quality of the wool, and such being the case care should always be taken to have the goods lather freely.

It is impossible to lay down any rule as to the amount of time required for fulling. Watch the goods and when they are fulled so they are soft and fluffy, stop the mill and let the soap run off. When one batch has been fulled all right other goods of the same kind can be run to time to advantage.

To rinse the goods turn on the water at 120 degrees F. Start the mill and run for 25 minutes with the gate open. Never let cold water touch the goods as it tends to harden the wool. Extract and board and dry with cold air if possible. If heat is used do not let the temperature in the dry room get over 120 degrees. The goods should be removed from the room as soon as they are dry; if left exposed to the heat they will be harsh.

In pressing use good thick fenders on the top and bottom of the package, fill the press and turn on the steam. Let the press stand until the goods are uniformly heated throughout the packages, then cool the plates and run up the press just far enough to take the wrinkles out of the goods. About two hours is long enough for all wool, but the time varies some according to quality.

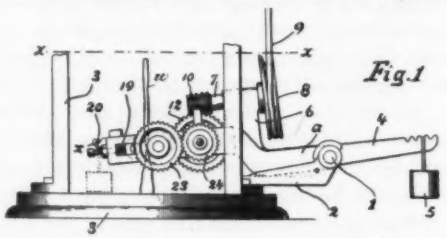
AN INGENIOUS TAKE UP FOR KNITTING MACHINES.

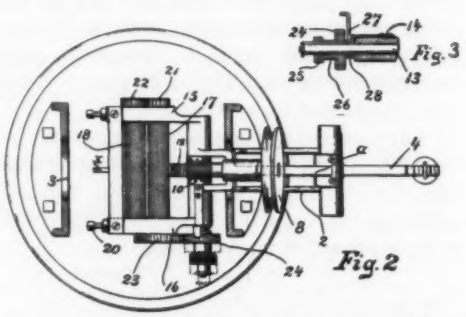
The advantage as claimed for the new take up consists in providing means for removing the fabric from the take up without interfering with the running of the machine.

The new take up consists of a pivoted and counterbalanced frame, carrying rolls and driving mechanisms therefor, between which the knitted fabric is automatically pulled with the proper tension. Means are also provided for temporarily disconnecting the take up rolls and their driving mechanism, so that the latter may not be interfered with in any way, and the rolls are free to move independently thereof, as required, thus omitting the necessity of stopping the machine, and turning back the take up mechanism by hand, as is the case in connection with other style of take ups.

Of the accompanying illustrations, Fig. 1 shows this take up in its side elevation. Fig. 2 is a horizontal sectional view taken on the line x x, Fig. 1, and Fig. 3 is an enlarged longitudinal sectional view of the disconnecting device.

The new take up, which as will be readily understood can be applied to any make of knitting machine, consists of a frame, a, pivoted at 1 to a bracket, 2, mounted on standard, 3, of the knitting machine. Said frame, a, has an arm, 4, onto which the counterbal-





ance weight, 5, is hung, so as to be able to regulate the degree of pull of the take up. Adjacent its pivot, 1, the frame, a, carries an upright portion, 6, in which is journaled a shaft, 7, which is provided at one end with a driving pulley, 8, driven by a belt, 9, from the driving mechanism of the upper portion of the knitting machine (not shown), whereas at its other end shaft, 7, is provided with a worm, 10, meshing with a worm wheel, 12, fast on shaft, 13, as is journaled in cross bar, 14, of the frame, which beyond said cross bar has two separated parts, 15-16, in which are journaled take up rolls, 17 and 18, the latter being adjustable in ways, 19, by means of adjusting bolts, 20. At one end these take up rolls are provided with intermeshing pinions, 21-22, and the roll, 17, at its oppo-

site end has a gear, 23, adapted to mesh with pinion, 24, splined on shaft, 13, and free to be moved longitudinally by a hand hold, 25, connected thereto by a sleeve, 26, while at its other end it is releasably locked in normal operative position by a spring, 27, engaging a grooved collar, 28, secured to the inner side of said pinion, 24.

IN OPERATION.

As the knitting progresses, the driving mechanism through the belt, 9, pulley, 8, worm gear, 10, wheel, 12, and train of gears therefrom causes the knitted fabric, w, to be taken up by the rolls, 17 and 18, as rapidly as it is knitted. If then for one reason or the other the knitted fabric, w, requires to be slackened or removed from the take up or tightened therein, the operator lifts up on the spring, 27, with one hand and pulls the pinion, 24, outwardly with the other hand, thereby instantly disengaging said pinion from the gear, 23, leaving the rolls, 17 and 18, free to turn in any direction that the knitted fabric, w, may be pulled by the operator, and by pulling on the knitted fabric the latter may be withdrawn from the machine. The driving mechanism of the take up is in turn re-engaged with the take up rolls, 17 and 18, by pushing pinion, 24, back into place, where it is locked by the spring, 27.

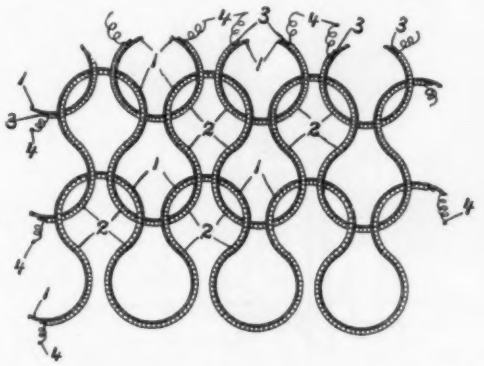
In connection with some kinds of yarns or fabrics the weight, 5, may be used at the opposite side of the fulcrum, 1, from that shown in the drawings, the loop of the weight then being entered in notch, x (see dotted lines).

The weight, 5, is to be used on lever, 4, when dealing with tender yarns, and in notch, x, when dealing with strong and heavier counts of yarn or large machines.

A HIGHLY ELASTIC KNITTED FABRIC FOR SURGICAL USE.

In the construction of this fabric, a late German invention, the loops are severally formed of an elastic thread and an inelastic thread, the principal object aimed at being to produce a fabric having a high degree of elasticity, which in connection with other qualities renders the same desirable for surgical and other uses.

The accompanying illustration is a diagramatic view of the new fabric structure, and which by means of quoting letters of references will explain itself. The material used consists of two threads, viz., a regular fibrous thread, 1 (silk preferred), and of a special thread, 2, comprising a core, 3, of elastic material (rubber preferred), and a fibrous covering therefore formed of a fibrous thread, 4 (silk preferred), which is wound around said core. This covering of the elastic thread, if preferred so, can be omitted. The two threads, 1 and 2, are maintained automatically by suitable devices, side by side, and in which position they are knitted in the common way, on a regular knitting machine, into fabric, relieving during the process the elas-



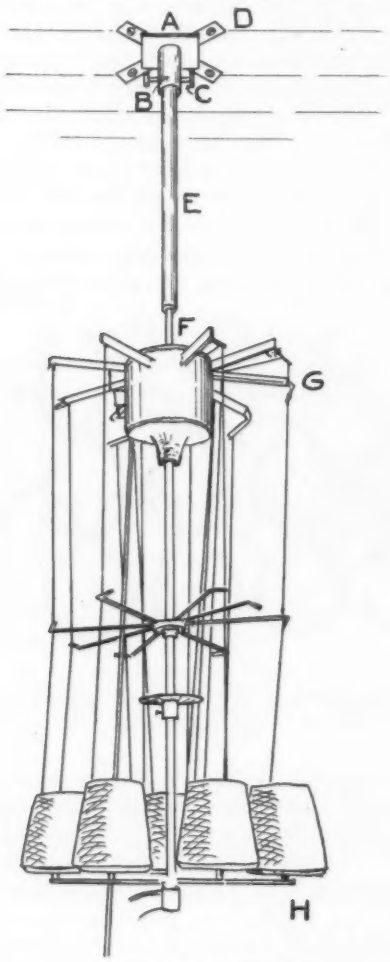
tic thread of tension and subjecting the fibrous thread to a comparatively strong tension.

The reaction of the fibrous thread in the thus knitted fabric will impart to the core of the structure firmness, while at the same time its looped construction permits the fabric to be expanded both longitudinally and transversely.

An important point to take into consideration during knitting is the proper tension for the two threads, viz., the respective difference in tension upon the elastic and inelastic threads, produced by the use of suitable tension devices, it being necessary that the elastic thread is maintained practically free from tension and the inelastic thread under comparatively high tension during the formation of the loops or meshes at the knitting.

A CLEVER KINK.

On a recent visit to the Henderson Co.'s knitting mill at Hampden, Georgia, I noticed a simple and very useful device employed to reduce the vibration of the stop motion on the knitting machines. Usually a wooden framework is attached at intervals to the ceiling over the tops of the machines, along the whole length of each row of machines. Holes are bored into the strip of wood directly over the top of each machine, and into these holes is inserted the top pin or rod attached to the cap of the stop motion, thus reducing the vibration of the stop motion head when the machine is in operation. This arrangement is one of the most perfect waste catchers in existence and an ever present source of annoyance to knitters.



A STOP-MOTION DEVICE.

The device at the Hampton mill is simple, performs the same office and yet reduces the gathering of waste to a great extent and obviates the possibility of danger when the waste drops down into the knitting machine—a frequent cause of smashes and imperfect work.

Attached to the ceiling over each machine is a cast iron square about 4 by 4 inches. At each corner are projections for screw holes; in the center is a socket facing downward about three inches long, fitted with two thumb screws. Into this socket a wooden pole about the size of a mill broom handle is fastened by the thumb screws. At the end inserted into the socket is a cast iron rim, or jacket, into which the thumb screws are imbedded to hold the stick firmly in place. At the other end of the pole is a socket drilled into the pole to receive the rod of the stop motion with sufficient space to allow reasonable play, where the stop motion is attached to a Scott & Williams machine, to revolve in the socket.

This pole or stick was well shellaced and presented a smooth surface to flying yarn waste and scarcely any adhered to the pole, while the vibration of the stop motion head was reduced to a minimum. A, cast iron frame; B, round socket; C, thumb screws; D, projections for screw holes; E, pole projecting downward from ceiling; F, rod from stop motion head inserted in socket in bottom of pole; G, stop motion head. The device is the design of the superintendent, Mr. Arthur D. Henderson, who is quite willing that other manufacturers should get some benefit from it, if they choose, through a description in these columns.

Nantucket.

A member of the Mulhouse Industrial Society has found that if thickened silicate of soda is printed on chrome mordant, the affinity of the latter for dyestuffs is diminished, while soda has the opposite effect. Taking advantage of these properties of the chrome mordant, he has succeeded in producing very fine shaded effects in the dyed style.

Power for Sewing Machines.

Editor Textile World Record:

How much power is needed to run ten sewing machines on knit underwear? Barr (545).

We submitted this question to an expert who informs us that the power required depends on the condition of the machines and how many needles are being run. He adds that the average power required for ten machines is 2 H. P.

Needle Pliers.

Editor Textile World Record:

Can you give us the address of a maker in England of the needle pliers used on full fashioned knitting machines? Incog (556).

We understand that these needle pliers can be obtained from the firm of George Blackburn & Sons, Nottingham, England.

The Sweater Business.

Editor Textile World Record:

A friend of mine contemplates engaging in the manufacture of knit sweaters and has asked me for an opinion of present trade conditions and whether in the future the demand is likely to be an increasing or diminishing one. Will you give me your opinion on the subject? Golf (568).

Our advice in this case would be largely influenced by whether your friend has a practical knowledge of the business. If he has sufficient knowledge to enable him to choose his machinery wisely, figure his costs accurately, and get up a line of goods that will meet the market conditions and demands, and to a certain extent anticipate them, we think there is a good chance of his success. If he has no such experience and would be dependent on a man that he will have to hire for the practical end, and upon the jobbers or selling agents for the other end, we think he had better think two or three times before he goes into the business.

So far as the future of the sweater business is concerned we see no reason why it is not as staple a branch of manufacture as underwear or hosiery. The tendency of the American people is toward outdoor sports, and not only for this use, but as an extra and emergency garment we think the sweater has come to stay, of course with such modifications as to style and originality as the fashion of the season dictates. A question of this kind can only be answered in a general way without more specific details of the case.

The National Automatic Knitter Co., Philadelphia, are very busy on orders for their National spring beard needle automatic seamless hosiery machine and fairly busy on ribbed machinery.

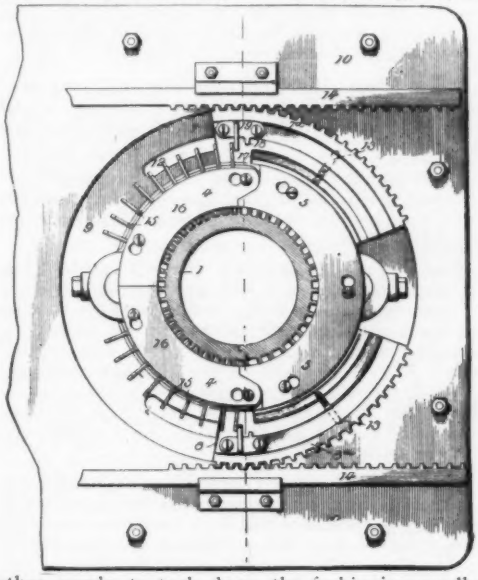
Recent Knitting Patents.

KNITTING MACHINE. 790,357. Emil J. Franck, Collingdale, Pa.

KNITTING MACHINE CAM Adjusting Device. Circular. 790,772. Frank B. Wildman, Norristown, Pa.

KNITTING MACHINE. 790,357. Emil J. Franck, Collingdale, Pa.

The present invention has for its object to provide simple, durable, reliable and efficient means for controlling the fashioning-needles to produce widening and narrowing and also tucking, or, in



other words, to tuck down the fashioning-needles when making the heels.

The illustration is a top or plan view, with the needle-cylinder in section, of so much of the machine as is necessary to illustrate a structure embodying features of the invention.

KNITTING MACHINE Bur-Wheel. 791,902. Seth T. Harshaw, Troy, N. Y.

The First Union Suits.

The hitherto unpublished Carlyle manuscripts have turned up at Hawick. One of them, dated Aug. 18, 1843, is from Thomas Carlyle's mother to her brother, and was written by the Chelsea sage, who happened to be on a visit to his mother at Scotsbrig. It is specially interesting to the people of Hawick from the fact that reference is made to "union dress, a woven spencer and drawers all in one, which women wear in winter time." This is believed the first mention of what is now popularly known as "combinations," a marked feature of the Hawick hosiery trade. The other letter is from Dr. J. A. Carlyle, translator of "Dante," a brother of Thomas Carlyle, acknowledging a parcel and "dresses" received by his mother, presumably the "union dresses" referred to in the first letter.—Montreal Witness.

KNITTING MILL NEWS.

New Mills.

Massachusetts, Cambridge. Samuel D. Cohen, who was formerly manager of the Boston Knitting Mills, is about to start now in the manufacture of sweaters. The Boston Knitting Mills changed hands some time ago, and is now controlled by Joseph Lowenberg, who moved the plant to Boston, and it is expected that S. D. Cohen will occupy the old factory at 12 Bridge St., Cambridge.

*New Hampshire, Laconia. Contract has been let for H. H. Wood & Co.'s new mill. It is expected that the new building will be ready for occupany about the early part of August.

*New Jersey, Vineland. The Karl & Levey Hosiery Co. has been incorporated to operate a knitting plant at this place. Mr. Karl was formerly at Mifflintown.

Pennsylvania, Adamstown. On June 19th Mohn Brothers started up in the business of knitting half-hose, and they are running 10 15/16 Boss latest improved knitters.

Pennsylvania, Allensville. J. T. & V. A. Zerby are about to start up a knitting plant in this town. A new factory is being erected which will be equipped with 20 knitters, two of which will be delivered within three weeks, to be run on half hose. J. T. Zerby will be the superintendent and V. A. Zerby will do the buying at the Philadelphia office, 3129 W. Cumberland Street. A gasoline engine will be used for operating the establishment and the goods sold direct.

*Pennsylvania, Avon. Light & Bamberger, whose plant at this place was recently destroyed by fire, have purchased a building, 120 by 60 feet, three stories, which they will equip with new machinery. So far 36 new Boss machines and 25 Bonnaz embroidery machines have been ordered. They will make a specialty of embroidered hosiery.

*Pennsylvania, Bechtelsville. The branch plant of the Kutz Knitting Mill (of Reading) has been started up, making white foot ladies' and half hose. Equipment comprises 78 knitting and one sewing machines. Goods are sold through John M. Given.

Pennsylvania, Doylestown. The Doylestown Hosiery Mills reports being sold up to January 1st of the coming year for their line of misses' and boy's ribbed hose, which they manufacture with 10 to 17 cotton yarn on 48 knitters, the plant being run by steam. Mr. Henry F. Drenk, the proprietor and superintendent, states that it is his intention to remove to another building, in the same town, at which time the capacity will be increased to 500 dozens per day. The mill which they are now occupying will be fitted up with the latest machinery for the purpose of dyeing and finishing, and also putting in machinery for manufacturing both paper boxes and packing cases. The goods are sold direct.

Pennsylvania, Philadelphia. The Oneida Hosiery Co., Oneida, N. Y., has started a branch mill at Front and Oxford Streets, making children's and misses' ribbed hose. The goods are to be sold under trade mark of "Cadet." It is expected to increase the plant to 700 dozen per day. Seth Bittle will have charge of the plant.

*Pennsylvania, Philadelphia. The knitting mill to be established in Germantown, recently mentioned by us, is now in full operation. The proprietors are Messrs. J. E. and H. M. Eddishaw, operating under the name of Eddishaw Bros., with Henry Eddishaw as manager, superintendent and buyer. The plant is located in the Cope Mills at Pastorius and Osceola Streets, where they are very busily engaged on fine grade ladies' and misses' hosiery on 25 knitters, 11 loopers and 2 sewing machines, the production being sold through New York. They use 2/36 Combed Egyptian yarn on cones.

*Tennessee, Cleveland. The Cleveland Hosiery Mills have been incorporated with capital stock of $50,000. George L. Hardwick is president of the company, F. L. Chipman (350 Broadway, New York), vice president, and C. H. Weiss, treasurer. Plant will be equipped with 125 knitting machines for making misses' hosiery. A new building, 150 by 40 feet, brick, will be erected.

*Virginia, Norfolk. Operations will start about June 15th by the Northside Knitting Company, which has purchased the plant formerly run by the Nyack Knitting Co. of Nyack, N. Y., and removed to this place. Company has capital stock of $25,000; Ralph Riddleberger is president of the company, F. H. Brayton, treasurer and A. W. Chapin, superintendent. They will make ladies' ribbed vests and pants, heavy weight, operating 17 knitting and 22 sewing machines. Goods will be sold through Critten, Clift & Co., N. Y. Electricity is the motive power.

Wisconsin, Sheboygan. The Hand Knit Hosiery Co. has recently been organized and started operating at this place. The company is capitalized at $7,000; L. A. Bentz is president and superintendent of the company and A. M. Bentz, treasurer. They manufacture woolen hosiery for men, women and children, hand knit goods and woolen mitts. Plant is equipped with 10 knitting and one sewing machines and dye house. Is run by steam. Goods are sold direct.

Enlargements and Improvements.

California, San Francisco. J. J. Pfister, president of the J. J. Pfister Knitting Co., San Francisco, Cal., the largest knitting mill in California, who has just returned from Europe and has been in Philadelphia for the past few days, reports that he has placed orders for considerable new machinery while abroad, which will be put into operation in their factory as soon as it arrives in this country. This concern manufactures knit goods of all descriptions and of the highest class of cotton, wool, and worsted yarn, which they sell direct. They are now operating 100 knitters and 30 sewing machines by electricity and employ over 150 hands.

New Jersey, Newark. Hugo Linder, manufacturer of fancy knit goods at 684 Springfield Ave., is about to remove his establishment to a new and larger building at 775 South 18th St., where he will increase his plant by putting in 10 more machines, not yet ordered, making the number operated 16 in all. Goods are sold through New York.

New Jersey, New Brunswick. Alfred March & Co. have removed to the building formerly occupied by the Brunswick Knitting Co., which has been removed to Putnam, Conn. Messrs. March & Co. are reported doing good business on children's ribbed full fashioned underwear, with an entirely new equipment consisting of 4 spring and 12 latch needle knitting and 20 sewing machines.

New York, Stittville. The Hackett & Atwood Co. has closed the plant for two weeks for purpose of installing additional machinery. This plant is run on underwear.

North Carolina, Newton. The Newton Hosiery Mills are now planning for another addition to be made to the plant.

Ohio, Mentor. The Mentor Knitting Mills have purchased the DeLong property and will soon start work on an extension of the mill.

Ontario, Clinton. Plans have been prepared by the Clinton Knitting Co. for a new building.

*Pennsylvania, Ashley. The West Knitting Mill has been idle for the past three weeks for purpose of installing new machinery and a concrete floor in the new addition erected last fall.

Pennsylvania, Greencastle. The Windsor Knitting Mills are to enlarge the plant and will employ from 60 to 70 additional people. A two-story addition, 30 by 45 feet, will be built and about 80 additional machines installed.

*Pennsylvania, Mohnsville. The new addition to Wm. G. Leininger's mill will be completed about August 1st. He will install 10 new knitting machines, giving the plant a total of 88 knitting and 14 sewing machines. This mill is run on men's cotton half hose, sold through Steele & Caruthers.

Pennsylvania, Norristown. The contract for the erection of the four-story addition to Rambo & Regar's Knitting Factory has been awarded to a contractor in Reading, Pa. The operation will consist, in addition to the enlargement of the main factory, of a boiler house, 24 by 43 feet, and a power house, 17 by 33 feet. Messrs. Ballinger & Perot of Philadelphia are the architects. Work will be started at once.

Pennsylvania, Philadelphia. Richardson Bros., manufacturers of infants' full fashioned hosiery and veils, have removed their plant from 2317 East Oakdale Street to 2109 East Seltzer Street, where they will occupy the entire building and in which they are putting a new boiler and engine. The firm, which is now known as Richardson Bros. & Gordon, are operating two full fashioned machines, two ribbers and two hand frames, but state that the establishment will be materially increased now that more room has been obtained, to permit them to get out their goods in larger quantities, the demand being very great. They sell direct.

Pennsylvania, Philadelphia. The Vesper Hosiery Mills, 1210 to 1214 Crease St., are contemplating making changes in their machinery, throwing out a number of the old machines now in use and putting in National knitters of a new and up-to-date pattern. The mills are very busy on ladies' and men's fine hosiery on 45 knitters. The members of the firm are James Creshkoff and Hoffman Bros., Mr. Creshkoff attending to the office affairs and Harry Hoffman superintendent of the factory. They are very busy.

Pennsylvania, Philadelphia. The American Knitting Mills, in order to increase their present capacity, have leased two more floors in the building where they are now located at 121 North 4th St. They will put in 10 new knitters, one winder and 5 sewing machines. They manufacture wool and worsted ladies' golf vests, blouses, etc., selling the goods direct.

Pennsylvania, Reading. On April 1st T. L. Seidel of the Colonial Hosiery Mill removed from Thorn and Walnut Streets to 637 Court Street. He manufactures fine infants' hosiery and half hose and is quite busy. He is operating 8 15/16 Boss knitters and expects to increase in the near future.

*Pennsylvania, Schuylkill Haven. Work has been completed on construction of the new three-story building for J. F. Bast. New machinery, including new boiler and engine, will be put in.

*Pennsylvania, Spring City. Work will be started July 1st on the addition to the Century Knitting Co.'s plant.

*Pennsylvania, Topton. The Crown Knitting Company, of which W. D. DeLong is president; G. F. Bard, treasurer, and H. A. Miller, superintendent, has added 20 more knitting machines to the plant, giving a total of 50 now in operation.

Mills Starting Up.

*Massachusetts, Worcester. The Aetna Hosiery Company has started operations in the plant formerly run by the Aetna Knitting Co. This company is capitalized at $15,000; John F. Cross is president of the company; Harry C. Young, treasurer and C. S. Holden, manager. They will make women's woolen, worsted and merino half hose, operating 4 sets woolen cards and 95 knitting machines. Goods are sold direct. This plant is also equipped with a dye house.

Michigan, Petosky. We have been advised by Albert Witte that he is to discontinue his hosiery mill.

Facts and Gossip.

Georgia, Dalton. Application for a charter has been made by the Dalton Knitting Mills, with capital stock of $10,000. W. C. Martin and S. R. Jones are interested in the company, which proposes starting operations in a short time.

New Jersey, Newark. The D. E. Knit Goods Co., with a capital of $25,000, and Wm. Brugger, president; Max Guenther, treasurer and general manager, and W. Brugger, secretary, reports business as active. This concern manufactures high grade sweaters on 24 knitters and 7 sewing and looping machines, making a specialty of the Patented Double Elbow and Shoulder goods, for which they are receiving many orders. The factory is located at 457 18th Ave., the goods being sold direct.

New York, Amsterdam. The Blood Knitting Co. has purchased property near the present plant and proposes building an addition.

New York, New York. A petition in bankruptcy has been filed against the Empire Knitting Company, 359 West Broadway.

*New Jersey, Riverside. Operations have begun in part of the new plant recently built by W. F. Taubel. The entire plant will soon be running.

Ontario, Toronto. The Puritan Knitting Mills, Ltd., have been incorporated with capital stock of $40,000, to continue the plant of the Puritan Mills.

*Pennsylvania, Lykens. The Lykens Knitting & Mfg. Co., recently reported incorporated with capital stock of $20,000, succeeds to business of Walter Duncan & Co. This plant is equipped with 42 knitting and 2 sewing machines for making ladies' seamless hosiery. W. Walter Duncan is president and superintendent of the new company and R. Coble, treasurer.

Pennsylvania, Mount Carmel. W. F. Taubel of Riverside, N. J., is reported to have purchased property at this place and will erect a new knitting mill.

*Pennsylvania, Philadelphia. C. & J. Gould have removed their plant at South Bethlehem to this place, where capacity has been greatly increased.

Pennsylvania, Philadelphia. The Brown Knitting Co., 2d St. and Allegheny Ave., have declared a dividend of 12 per cent. on account of business done during the past year. The company manufactures full fashioned hosiery for women, misses and boys on 500 spring needle and 96 latch needle machines.

Pennsylvania, Philadelphia. The Brown-Aberle Co., manufacturers of ladies', misses' and infants' full fashioned hosiery on 900 knitters at Palethorp and Huntingdon Streets, have just issued a statement to their stockholders declaring a dividend of 9 per cent.

Pennsylvania, Philadelphia. The Baker Manufacturing Co. has disposed of its weaving plant at Church Lane and Lena Streets, Germantown, and is now opreating its knitting plant, to which they are giving their entire time. This plant, which is located at 41 Ashmead Street, is run on knit gloves, jackets and sweaters, with 50 latch and 10 spring needle knitters and 12 sewing machines, the goods being sold through New York. The capital is $25,000 and officers: Edward Parkinson, president; Francis R. Masters, treasurer; Clifford H. Baker, secretary. Mr. Parkinson also superintends and buys for the establishment.

South Carolina, Aiken. B. Bates, who keeps a general store at this place, is going to put in a few knitting machines to be used by his clerks and helpers in idle time. Probably they will not put in more than 8 or 10 to start with.

Vermont, Brattleboro. An attachment has been placed on the Brattleboro Mfg. Co.'s plant, operated on hosiery. It is stated that several creditors will petition the company into involuntary bankruptcy.

Personals.

Frank D. Sanborn has accepted a position at Derby, Conn., at the Paugasset Mills.

Albert Engle has been engaged as overseer of knitting at the Chesapeake Knitting Mill, Berkley, Va.

P. C. Harris, late superintendent of the Wahneta Knitting Mills at Cedartown, Ga., has accepted the superintendency of the Adams Knitting Mills in Gadsden, Ala., and has assumed charge. He succeeds E. L. Nance.

Frank J. Prue of Frank J. Prue & Co., Woonsocket, R. I., who has been confined to his home by illness, is able to be out.

William R. Carroll, a member of the hosiery firm of Cozzens & Carroll, died recently.

John Pennington, former superintendent of the Camden Textile Co., Camden, N. Y., has accepted a position as superintendent of the Swansdowne Knitting Mills at Hudson, N. Y.

W. B. Neilson of Troy, N. Y., has been appointed superintendent of the Groat Knitting Company, Scranton, Pa.

P. C. Harris, former superintendent of the Wahneta Mills, Cedartown, Ga., has accepted a similar position with the Adams Knitting Mills, Gadsden, Ala.

James Howie has resigned his position with the Musgrove Knitting Mill, Pittsfield, Mass.

An experienced man is wanted immediately who can adjust and knit underwear on Lamb machines. Address Lamb Knitting Machine Co., Chicopee Falls, Mass.

O. Nestler of Lynchburg, Va., has accepted a position in Philadelphia in a knitting mill.

George Manderfield, well known to the knitting trade, has accepted a position as traveling salesman with the National Automatic Knitter Co., Cherry St., Philadelphia, Pa.

James B. McCauley, manager of the Swansdown Knitting Company, Hudson, N. Y., has resigned on account of ill health.

H. J. Damp has resigned his position in Amsterdam, to accept a position in St. Johnsville, N. Y.

New Lines of Knitting Machinery.

The Grosser Knitting Machine Co., 260 W. Broadway, New York, have recently added to their line of machinery, and now advertise special machines for any article that is knit. Mr. Max Nydegger, manager of the American branch, has recently returned from a visit abroad, and perfected arrangements, so that they can supply all requirements of their customers.

Besides the Grosser flat knitting machines, they now sell cotton patent hosiery machines, built by H. A. Ludwig of Chemnitz, for the automatic production of full fashioned hosiery, fine underwear, etc., also the celebrated Terrot French frames, manufactured by T. Terrot Sohne, of Cannstadt, which have the reputation of being the best circular frames built abroad for fine underwear, fleece-linings, gloves, etc., also Rashel machines for fancy goods, such as shawls, capes, caps, fringes.

In the line of auxiliary machines they will now carry spoolers, paraffiners, finishing machines, Kohler's special overseamers for full fashioned articles, sweaters, etc., and a large stock of needles for all kinds of machines that they sell, as well as other machines, will be carried in stock for immediate delivery.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Reproducing Designs. Williams, Brown & Earle, 918 Chestnut St., Philadelphia, Pa., are putting on the market an apparatus, by which any design, either plain or colored, can be projected on an easel of any size desired, and can either be drawn or reproduced. It is described at length elsewhere in this issue.

A New Lug Strap. W. H. Kelly & Co., 1850 Perkiomen St., Reading, Pa., have, after a great amount of experimenting, succeeded in perfecting a new lug strap which they call the "Black Diamond," and are now placing on the market. The Botany Worsted Co. of Passaic, N. J., has placed an order for these lug straps and a number of other manufacturers are putting them in.

New Cotton Gin. An improvement in cotton gins, known as the Fuller cotton gin, is being introduced, in which the combing principle is applied to saw gins, substituting a round edge blade for the rib in the saw gin and the knife blade in the roller gin. This, it is claimed, overcomes the defects of the saw gin and gives a larger product than the roller gin.

Conditioning Nozzle. Paul Lechler, Stuttgart, Germany. A nozzle for distributing moisture in store rooms where textile materials are stored for the purpose of increasing their weight by absorbing water from the surrounding atmosphere. It is described in another part of this issue.

Singeing Machine. J. J. Dierichs Sons, Barmen, Germany. A singeing machine for cloth by which the fabric is subjected to a spray of water before and after singeing. This spraying of the goods prevents the flame from penetrating too far into the texture and also prevents damage to the fabric by sparks.

Sewing Machine for Dye Works. Wm. Mycock & Co., Salford, England, have brought out an improved sewing machine for use in bleaching, dyeing and finishing works. The improvements consist in a new method of carrying the cloth forward under the stitching needle which prevents it sticking to the pins which carry it forward, and important changes in the needle head and driving parts which are said to warrant better and larger production.

Automatic Loom. Wm. R. Stitt, Belfast, Ireland, has patented a new automatic loom of which the principal feature is the adoption of a hinged shuttle box which is capable of swinging forward until at right angles to the lay.

Folding and Measuring Machine. Wilson-Clyma, Lille, France, is putting on the market a new folding and measuring machine which is said to embody many improvements over the usual form. It is said to make folds from 12 to 40 inches in length on goods of any width.

Shipper Motion for Drawing and Spinning Machines. Samuel Walker, Lille, France. A device for stopping single heads of drawing machines, thus obviating the necessity of stopping the whole machine.

Raw Stock Dryer. Bernhard Cohnen, Grevenbroich, Germany. The raw stock is placed in drawers or boxes which are held in position in two connecting compartments. The upper box in one compartment is passed to the other room while the lower box in the latter room is transferred to the first compartment. Two fans cause an air blast to pass upward on one side and downward on the other. When one box is placed in position an automatic device raises the whole series so as to prepare another box for transfer.

A NEW LINE OF CLOTH CUTTING MACHINERY.

Inventors are apt to be over sanguine, and to promise more than they perform. Premature announcements are made that a machine has been perfected and is in successful operation in the mill, but when the would-be buyer looks at it, it often proves to be a disappointment.

It is refreshing to come across one of the inventor class who has spent more time in work than in making announcements. It appears that a rare specimen of this sort has been located in Brooklyn, N. Y., at Fourth Ave. and Baltic St.

For the past seven or eight years James A. Cameron has been saying nothing but "sawing wood" all the time. He has been working out a line of machines adapted to the cutting of all kinds of textile fabrics in the various ways required by manufacturers of cloth, and by the manufacturers of articles made from cloth.

This line of cloth cutting machinery has been completed by the final perfection of what is known as a doupe cutting machine, which has been briefly noted in our New Machinery Department. Although it is the last of the line in the date of its development, it is perhaps of greatest interest to the manufacturer.

Any manufacturer of broad silks knows that a doupe is a false selvage woven at intervals in broad silks, so that when the web is cut up exactly down the lines of these doupes the result is several narrower webs, each with a practical selvage. The cutting up of these broad webs into narrower widths on the line of these doupes has been ticklish business. The work has universally been done by most dexterous and clever manipulators, who have held a keen knife in the path of this doupe as the cloth was drawn over beams. However skilful these operators have been, they have continually cut into the body of the web and damaged the cloth, for it is not a human possibility always to follow the path of a warp thread with a hand cutting tool. All manufacturers have consequently been dissatisfied with the hand method, and many of the larger mills have conducted experiments with a view to perfecting a doupe cutting machine. But, for one reason or other, none of their experiments have proven entirely satisfactory.

Mr. Cameron's machine has recently been put "through the mill," has stood the test of most exacting requirements, and has performed its work so as to satisfy the strictest sect of the academicians of cloth manufacture.

The consequences of the development of a machine which relieves the manufacturer of the anxiety and loss incident to the imperfect hand methods of broad silk cutting are interesting to speculate on. One of the chief considerations that has restrained cloth manufacturers from weaving a greater quantity of multiple width stuff than is at present produced is the unsatisfactory cutting process, and the consequent prejudice in the market against these Joumel edge goods. Now that the cutting problem seems to be solved, it is safe to assume that the production of multiple widths will be stimulated.

Another important consequence of the development of a successful doupe cutting machine is the relation that such a machine may come to have to ribbon manufacture. The present practice of weaving ribbons in single widths has been departed from in only one instance and that is in the case of "baby ribbon," which is woven in broad webs and separated by various devices. Mr. Cameron has completed a machine for this work that has been in operation for nearly eighteen months, concerning which he has said nothing until now. But to go on with the ribbon story: Certain devices related to the doupe cutting machine have been worked out by Mr. Cameron which give perfect results, in cutting apart a web of goods in which the doupe appears every inch or so, and producing a corresponding number of ribbons, each with a perfect selvage, while all the ribbons have been woven and finished simultaneously. The saving and other desirable features of this process are obvious. The machines for performing the separation are now in practical operation and have passed the experimental stage.

It will be well worth the time of manufacturers in many of the textile lines to consider whether some of their goods which are now made in narrow widths might not be woven broad and separated afterwards.

This practice is prevalent in England, where prints for export are woven on wide looms, printed on wide machines and split after finishing so as to make narrower widths, and in many cases, particularly in the Philippines, the narrow goods come in under a lower duty. This gives the English manufacturers an advantage in the markets of the world as they are able to produce these splits in large quantities at a very low cost. As the export trade of American mills increases in importance, our manufacturers will be obliged to take advantage of such methods to compete with English mills.

designed for them by the same industrious builder of special machines.

Mr. Cameron makes special cloth cutting machines for handling "friction cloth," such as is cut up into strips and is then known as insulating tape or bicycle tape. Another process has been perfected for the cutting of typewriter ribbon. Other special cutting machines are devoted to tapestry borders, lace curtain net, handkerchief lawns, strip for rag carpet, strip for ladies' collarettes, etc., etc.

Regarding the various machines of his manufacture, Mr. Cameron has this to say: "Some seven or eight years ago I conceived

THE CAMERON DOUPE CUTTING MACHINE.

Another machine which Mr. Cameron has developed for the embroidery trade and for the users of large quantities of fancy cloth, like the shirt manufacturers of Troy, N. Y., has been designed to cut cloth on the line of a printed or woven pattern. Wherever it is necessary to cut cloth into strips for any purpose, this machine applies. It has been previously noted in these columns that the manufacturers of bunting flags have adopted a type of cloth stripping machine especially

the idea that it would be worth while to try to devise machines to perform a number of operations in the cloth cutting line that I knew were not provided for by satisfactory machine methods. First I made experiments on a machine to cut a strip that was straight and even and everything that a strip ought to be. The method was then to cut a cloth strip by means of paper cutters or any other old implement that would serve in lieu of a real live cloth stripper. I made the stripper, and

W. B. Conrad & Co. of Brooklyn or the Warner Bros. Co. of Bridgeport or any one of many other concerns will say: "He did, and a good one, too."

"I have devoted many a headache to solving problems in the cloth cutting line, and the result is a series of machines which seem to cover about all the demands likely to be made for some time to come.

"The reason that I have not been advertising or otherwise exploiting these machines is that I have not cared to arouse the curiosity of the ever-active infringer until I had placed a few odd dollars in fees in the patent offices of the various countries which maintain them.

"Now that I have secured a few cast-iron patent claims on each of my line of cloth cutting machines, I am inclined to take everybody into my confidence and to explain the working of my machines to anyone interested.

"I can say furthermore that this business of pioneering in the machinery line is all very nice when the machines are completed and working successfully, and the maker gets a pat on the back and some real money from the user, but there are more than a few hard knocks on the head that come along before the pat on the back arrives. I have had my share of the former and am now getting a gratifying taste of the latter.

"Without a doubt many of your readers would be interested in one or another of my special machines and I am more than willing to sit up late discussing them with anyone who cares to talk them over."

MACHINES FOR WORKING WASTE.

An English firm, Messrs. P. & C. Garnett of Cleckheaton, Yorkshire, Eng., has given its name to a very useful machine, the "Garnett," which is widely used for opening waste and preparing it for reworking in the manufacturing processes.

The use of these machines is constantly increasing as their value becomes more widely known, and in the various expositions where they have been exhibited they have received the highest awards. At the recent Bradford Exposition, two of these machines attracted special attention. The first was a Garnett opener. It has two cylinders, five feet in diameter, and so constructed that one or both cylinders can be used as desired.

This machine opens up all sorts of waste, whether from worsted, wool, or silk goods and either cotton or wool knit stock. The feeding is done by an automatic apron. Beneath the cylinder is a screen of an improved pattern, which prevents material from falling under the machine.

The feed roll is furnished with 16 rows of teeth per inch; the first three workers have 10 to the inch, and the back roll has 20 rows to the inch. The machine works on the finest stock, and it was one of the members of the firm, Mr. J. H. Leather, who invented the process of regulating the teeth in the cylinders in order to obtain the number indicated above.

To facilitate the work of the opener the same firm have built a second machine, called a preparer or knot breaker. As its name indicates it is designed to break all sorts of lumps and knots in the stock before it passes to the opener. By this means the waste stock is put in condition to be easily spread in the apron of the opener. The machine will take out nails, pieces of wire and all other hard substances. As a consequence the working parts of the opener are less likely to be damaged and the machine itself will last at least twice as long as if run on stock full of knots and bunches. The work of this machine is therefore most important.

In seeing the opener at work, supplemented by the preparatory machine, one is impressed with its solidity and steadiness in operation and also at the results; the mixed stock, which is fed to the machine full of apparently inextricable lumps and bunches, comes out having the appearance of well carded wool, without a thread and ready to be worked and spun anew.

The preparatory machine will also card out pieces of sacks, rope, jute and all hard textile materials.

The cylinders of the latter machine are 24 inches in diameter, the workers 4 1/2 inches, and the carding brush 20 inches. The sides of the machine are sheet iron.

These machines were not the only ones exhibited by Messrs. Garnett. They also had

their metallic cards, so justly popular abroad, as well as the card clothing with the points hardened by electricity, which is made by this firm. The appearance of their exhibit showed that they have gone far toward perfecting their specialties.

A REFLECTING LANTERN WHICH HAS INTEREST FOR DESIGNERS.

A NEW REFLECTING LANTERN.

This apparatus has, we believe, important possibilities in textile lines. The primary object of the inventor was to perfect an instrument which might be used in schools and colleges, especially for nature study work, where it is desirable to show before large classes such objects as pressed flowers in their natural colors, butterflies and other insects, specimens of chemicals and ores, and also illustrations from books and sketches without injury to the originals.

After long experimenting Messrs. Wil-

liams, Brown & Earle, 918 Chestnut St., Philadelphia, Pa., have succeeded in perfecting what they call a reflecting lantern which fulfils this object. Within a short time one of these outfits has been installed in the Agassiz Museum at Harvard University, others at Cornell, Vassar, and several hundred other institutions.

Several months ago a large manufacturer of textile fabrics saw one of them in use in the laboratory of one of the colleges and conceived the idea of using it to reproduce textile designs. He visited the manufacturers and after making careful experiments with the apparatus had one installed in his factory where it is a most helpful auxiliary in the designing department.

The illumination in the lantern is produced by an electric lamp which can be adapted to any ordinary lighting circuit. Any illustrations, photographs, sketches, or natural specimens of any kind can be shown directly on an easel or screen, and illustrations in a book can be shown without injuring the book in any way.

The illustration gives an idea of the working of the apparatus and the picture shown on the screen is reproduced from a page of the Textile World Record without the slightest injury to the copy. Fabrics which it is desirable to reproduce can be treated in the same way, and many other uses will occur to the designer. A most important feature is that the colors can be accurately reproduced.

The cost of the outfit seems to be very reasonable in view of what may be accomplished with it, and apart from its purely business use it would always be a source of pleasure for social occasions.

To ascertain the presence of linen fibre when in conjunction with cotton, a cutting of the fabric, after fringing, is dipped for some minutes in a lukewarm alcoholic solution of cyanine or quinoline blue, and then rinsed, first in water and then in diluted sulphuric acid. Cotton is again decolorized, while linen remains distinctly blue, the intensity of the shade being increased by a final immersion in ammonia.

A NEW BUFFALO UNDERWRITER FIRE PUMP.

The accompanying cut shows the 1905 model of the Standard Underwriter fire pump as built in strict accordance with the 1904 specifications of the Associated Factory Mutuals. A brief description of this pump is interesting as it is a machine which the cumulative experience covering fifteen years' service under critical eyes has developed to its present state of perfection.

The Underwriter fire pump is of the duplex type, built in a very substantial manner and with certain improvements suggested by the experience which the insurance inspectors have had with fire pumps—a great many of which have been found in a partly disabled or deteriorated condition or incapable of delivering the rated volume of water without violent water hammer when suddenly called upon for test by the inspectors. In 1891 specifications were first drawn up by the Associated Factory Mutual Fire Insurance Co. for a fire pump which would be more reliable than the types in use, providing protection in time of emergency by avoiding all danger of sticking, bursting, non-delivery of rated capacity or inability to operate at the minimum steam pressure. Since that date close attention has been paid to the behavior of such pumps with the result that specifications were made more complete in 1895 and finally revised and more rigidly applied in 1904, in conformity with which the illustrated pump is built.

The points in which this pump differs from the ordinary type are mainly as follows:

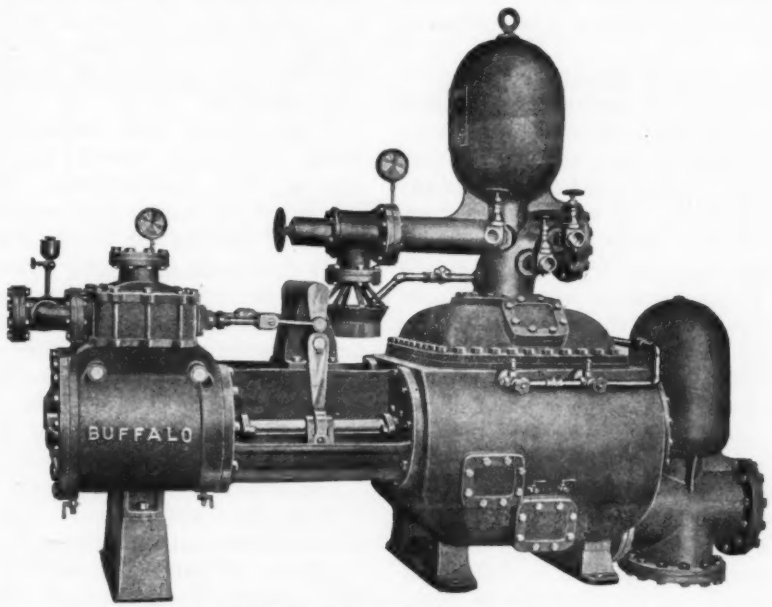
Its steam ports, water passages and air chamber are much larger than in common trade pumps so that a large volume of water can be delivered in an emergency without water hammer.

It is rust-proofed that it may start instantly after disuse, by making its piston rods and valve rods of Tobin bronze instead of steel; its water pistons, stuffing boxes and rock shaft bearings of brass instead of cast iron. Its valve levers are of wrought iron forgings or steel castings.

The pump is so designed as to be continu-

ously primed irrespective as to whether the wet or dry system is used, but as an additional safeguard a set of brass priming pipes are connected permanently to the water main and are provided with special checks and air cocks.

Six hand holes of generous size provide means of ready access to both sides of water valves. The vacuum chamber seen at right of pump is another feature peculiar to this style of pump and has been found necessary for smooth operation when running at high capacity. It will be noticed that there are two suction inlets permitting the most convenient connection with supply pipe, a blank flange being furnished for the unused inlet.



A NEW BUFFALO UNDERWRITER FIRE PUMP.

A relief valve of approved make is attached to the delivery pipe immediately under the air chamber and prevents any possibility of wrecking pump or pipe line through excessive pressure. A pressure gauge on delivery pipe and a steam gauge on valve chest indicate at a glance the condition under which pump is working. The customary cushioning valves are found on the steam cylinder together with a sight feed lubricator and lever handle pet cocks.

To these fittings must be added a set of hose valves (two to six), an overflow pipe with valve and cast iron relief valve discharge cone; also four one-half-inch air cocks and checks, a stroke gauge and a capacity plate. These attachments are all included with the price of pump, so that it is delivered complete in all particulars and ready to operate the moment it is set on its foundation and connections made.

In addition to the many structural features these pumps (they are made in five sizes) are thoroughly tested before leaving the works, the water cylinder being subjected to a pressure of 300 lbs. per square inch before approval. Each pump is guaranteed to be in full accordance with the specifications, and is sold subject to approval and acceptance by the insurance inspectors.

The pump as above described is one built by the Buffalo Steam Pump Company, a firm now owned and operated by the Buffalo Forge Co., Buffalo, N. Y.

The principal requirements for the successful cultivation of cotton are a warm and moist atmosphere, a soil containing lime and potash and a climate in which eight months are practically free from frost.

THE VALUE OF UNIFORM HUMIDITY.

No mill manager needs to be told that a certain amount of humidity is necessary in textile working. He has learned by experience that during part of the year, unhappily short in our climate, everything works smoothly and easily, while at other times there is trouble. What he wants is to reproduce at all times the conditions found in the fine June days when the work is at its best. To do this is essentially a matter of artificial moistening of the atmosphere. The effect of humidity on textile operations is far more complex than appears at first sight. Slightly moist material works more smoothly than when dry or too wet, because the fibres are more flexible and coherent when properly moistened.

The trouble due to dry yarns has sometimes been wrongfully charged to electrification, which of course is favored by a dry atmosphere. But a dry yarn and a moist yarn are two different things mechanically, as any experienced man can tell by handling them. Electrification is only an incidental trouble which is easily overcome by the same means that allays the mechanical trouble. To secure a uniform product the material must be worked under uniform conditions, from card to loom; and herein lies the value of judicious humidification. The average amount of humidity does not tell the story. It is the uniformity of this amount which counts, both from day to day and from machine to machine.

The best natural condition for textile working is generally recognized to be that found in New England on certain days in June, when the average temperature in the mill registers 75 to 80 deg. F., with a relative humidity of 50 to 65 per cent., absolute humidity 5 to 6 grains of moisture per cubic foot of air. Such days are neither remarkably warm nor remarkably humid—far less humid in fact than some artificially moistened rooms in many mills—but the humidity is steady. This counts not only in the working of the material, but in the working of the machinery. The shuttle that works with perfect smoothness when in an atmosphere of 55 or 60 per cent. of relative humidity will stick in the box and be a constant source of annoyance at 70 or 75 per cent. humidity, and will rebound when the humidity falls to 40 or 30 per cent. Adjust shuttle or box to run well at unusually high or low humidity and if the windows are opened for a little fresh air the humidity will change enough to keep the loom fixer hustling. He may not know just what the trouble is but the hygrometer would tell him. In humidity, as in most things, the golden mean should be observed, that mean which it is easy to maintain with a self-regulating apparatus but which will be lost if one trusts to chance. With a steady and moderate moistening of the air, yarns, shuttles and belts all work uniformly and smoothly, and one can let in fresh air with less fear of interfering with the normal humidity of the room. The less extreme the inside conditions the less they will be disturbed by outside conditions.

These points are brought out in a booklet recently issued by the designers of the Bell system, who believe that for these reasons their apparatus has peculiar advantages for textile manufacturers. They claim that a humidity system, in order to give the even distribution and automatic regulation of humidity from which comes the uniform conditions that textile manufacturers desire, requires that all the auxiliary apparatus should be as nearly automatic as possible, without having to depend on the watchfulness and care of the operators.

The object of the Bell System is to reproduce the best working conditions and automatically maintain them throughout the year, regardless of external conditions. It must not, however, be understood that it is designed for the regulation of the temperature. It is run in textile working purely for air moistening.

The manufacturers of the Bell humidifier claim as a very essential feature "that it delivers, not a spray, which tends to condense into dew and wets rather than moistens, but air carrying the requisite moisture as aqueous vapor just as it is found in nature; that aqueous vapor moistens thoroughly and uniformly, while water delivered as a mist tends to settle in fine globules instead of finding its way at once to the fibres, and in particular

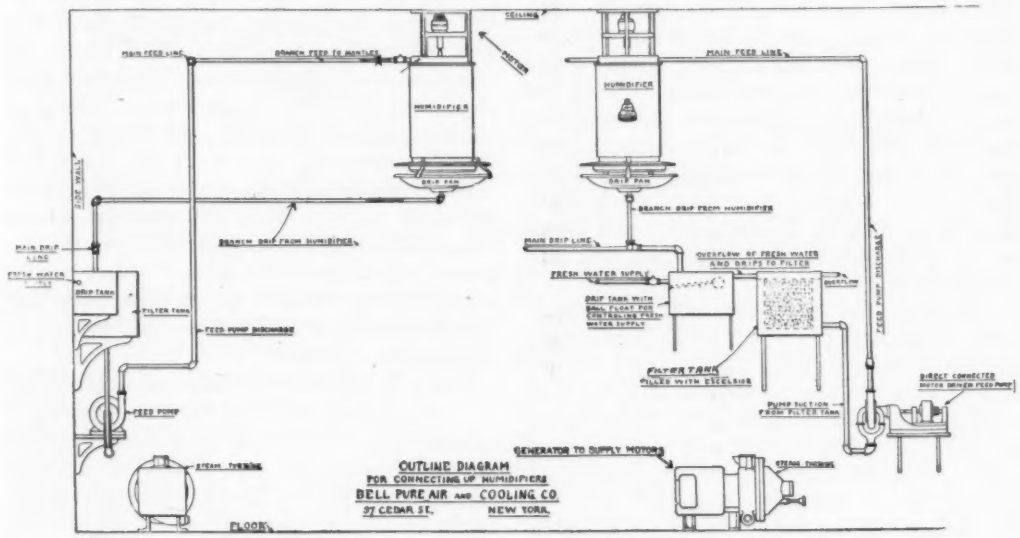
tends to produce a very wet region immediately surrounding the spray, while leaving the air at a little distance comparatively unaffected."

The Bell System is, therefore, claimed "to moisten more thoroughly and uniformly than any spraying device, and consequently produces better and more uniform results, both in the quantity and quality of the product."

Further advantages claimed for the Bell System are "that it is not complicated, and requires a minimum amount of care; that it tends to lessen the extremes of temperature and to improve ventilation as well as to provide uniform humidity, and that it does all this in a self-contained apparatus which can be applied to one room or to a whole mill with equal facility. It is maintained at moderate cost and does its appointed work steadily and thoroughly."

The accompanying diagram shows the general plan of equipment.

Further particulars may be had from the Bell Pure Air & Cooling Co., 97 Cedar St., New York.



In 1831 the Massachusetts legislature passed an act authorizing the preparation of a manual on silk culture and large orchards of mulberry trees were planted. The production of silk in one year amounted to over $150,000, but in 1839 the silken bubble burst.

A NEW AND BETTER METHOD OF OPENING COTTON.

The success of the patent Hopper bale opener, built by the Howard & Bullough American Machine Co., Pawtucket, R. I., is being clearly proved by the large number of machines being built and furnished to the leading mills both North and South. While the old type of bale breaker was a distinct advance over the hand-pulling method, the present machine is still another improvement and one which will be appreciated by the cotton manufacturers. The object of the patent Hopper bale opener is the thorough opening of cotton direct from the bale without damage to the staple and the saving of labor in the opening room.

In addition to these features there are other points of decided merit. The use of this machine will enable the mixing of waste with the raw stock in any desired proportion. The various shades of cotton from different bales, when put through this machine, are no longer traceable in either yarn or cloth, owing to the thorough mixing which the cotton receives.

In order to encourage home manufactures, during the reign of Edward III, an act was passed which prohibited the wearing of any cloth not an English fabric.

Dyeing, Bleaching, Printing, Etc.

MILL COST.

BY BAUMWOLLE.

Much has been written in textile journals about mill cost and much more remains to be written. The science of exact mill cost means simply good bookkeeping in order to have a proper knowledge of how much or little gain is made out of the mill business. It is safe to assert that there is no business of the world where there is so much guesswork as there is in the textile business of today. Many mills have no accurate system of cost finding at all. They simply take stock semi-annually, balance the books, and if they have received more than they paid out, their guess was a good one and everything is well, but many times after taking stocks and balancing the books the result is a large loss to the mill and, of course, to the stockholders. Why is this? It is because they have guessed at the cost of making certain fabrics and found out after the goods were made and sold that the guess was wrong.

This condition should not exist in any business, certainly not in a mill doing business up to the two million dollar mark every year, but it does exist in many mills and in some that have been fairly successful, too. What is the system used in many mills to get the cost of carding, spinning, weaving, dyeing, finishing, packing, etc.? The superintendent will go to the carder and say: "Mr. Jones, what will it cost you to make a ten-hank roving?" Mr. Jones begins to figure it out in his own mind; he does not want to be dishonest or untruthful, but he has a certain amount of pride and wants to do his work at as low a cost as Jim Brown, who is the carder in a neighboring concern making similar fabrics, so he gives the superintendent his cost, based probably on a day's or a week's run under the most favorable conditions. Perhaps he figures everything in and perhaps he doesn't. He may figure all the operatives in on the cost and leave out the elevator man, his section hand, his second hand and himself, all of whose wages should have been added to the cost of that roving. Then Mr. Jones' cost will be low, so low in fact that the mill will be doing business below the cost of making the roving. It will be the same with the spinner, the weaver, the dyer and the finisher, and when the goods are sold and the selling commissions paid there is little or nothing left for the mill. Why? Because the mill has not taken the precaution that an individual would take if he were doing a business of a few thousand dollars a year.

In order that mill costs may be ascertained exactly there should be a bookkeeper in every department large enough to have one, and if there is not work enough for an accountant in one department, he should keep the books of several departments. The costs should not be figured from a day's work or a week's production, but from the exact cost taken from the books every week, apportioning each item of labor and material among the different processes. In this way the superintendent knows whether the cost has increased or diminished during the week and should there be a marked increase in cost he should ascertain why.

There is another method commonly used in mills to get at cost, that is, figuring a supposed or theoretical production against the weekly payroll. In this way the average cost per pound is found and everything, coarse or fine, is figured from it and generally lower than it should be.

It is not the intention of this article to go into details as to the cost for the whole mill, but to give an outline of a system that is used in some mills to ascertain cost. So much has been written about the costs in the carding and spinning and other departments, that an article on the costs in that other important but neglected department, the dyehouse, should be of interest.

This department expends thousands of dollars each year for materials used in coloring, and the basis for calculating the expense in nearly every case is the semi-annual stock

taking, figuring the supposed production against the pay roll for the labor cost; the cost for drugs being found by figuring the production against the value of the colors used in

Date ..... May 1, 1905
Order 636
Style 407
Pattern ..... H
Yarn ..... 30 Single
Ends 500
Length ..... 10,000 yds
Warps in set 4
Color ..... Black
Dyed by ..... Burke & Shea
Weight ..... 200 lbs.

FIG. 1.

six months. This is one way to ascertain cost, but it is not the correct one. Some mills have a system for keeping cost in dyehouses so that the mill cost for each color is known not only for every set or batch, but also for every day, every week, and at all times exactly and accurately.

To illustrate, let us take a dyehouse doing 100,000 pounds weekly, divided as follows: 20,000 pounds warps dyed long chain system, 40,000 pounds of indigo dyed yarn and 40,000 pounds of raw stock. As the same plan is followed out in each department of the dyehouse we will use only the warp dyeing to explain the system. In all mills when the work leaves the warper a ticket is attached made out something after style shown at Fig. 1.

As there are four warps in this set they will, as a general rule, be dyed at one dyeing, thus making four times 200 pounds, or a set of 800 pounds, so after having been boiled and doubled they will go into the dyehouse for dyeing and the dyer will make out an order for drugs as shown at Fig. 2.

WARP DYEING DEPARTMENT

Date	Order	Style	Pattern	Weight
5/1	636	407	H	800 lbs

64 lbs Sulphur Black
128 " Sodium Sulphide
8 " Soda Ash
80 " Salt
8 " Soap
40 " Softener

J. Himmel.
(20 hours) Overseer

FIG. 2.

This order will go into the drug room and be filled out and every day the second hand will go into the drug room, collect the orders from the drug man and charge up the labor, which in this case is that of two men, Burke and Shea, 10 hours each at 15 cents per hour, or a total labor cost of $3.00. The orders are now sent to the bookkeeper and entered on the ledger under the heading of Sulphur Black, in the form shown at Fig. 3.

Sulphur Black

	Order	Style	Pattern	Weight	Sulphur Black	Sodium Sulphide	Soda Ash	Salt	Soap	Cotton Softener
May 1	636	407	H	800	64	128	8	80	8	40

FIG. 3.

At the end of each week the bookkeeper figures up the weekly production, charging the labor of each set to the color to which it belongs, adding the proportionate share of overseers, second hands, the boiling box hand, splitter hands and dryer labor, which in this case we call .00325 per pound. To this is

added the direct labor, .00375, making the total labor cost .007 per pound. To this is added the drug cost obtained by charging each item against the number of pounds dyed, as follows:

64 lbs. Sulphur Black, at 25c.	$16.00
128 lbs. Sodium Sulphide, at 2c.	2.56
8 lbs. Soda Ash, at 1c.	.08
80 lbs. Salt, at .005c.	.40
8 lbs. Soap, at .05c.	.40
40 lbs. Softener, at 5c.	2.00
Total drug cost,	$21.44

cost of .005; 20,000 pounds of another color may cost .03 per pound. Sometimes both go into the same line and are sold at the same cost per yard to the mill, so it is essential to know just what each color going into any line of goods will cost in order to figure the cost of the goods accurately.

To illustrate here we will take the case of three blues, 1, 2, and 3. The drug cost on 1 is $0.005; on 2, $0.008, and on 3, $0.0275. If a large percentage of sales are on the dark shade, 3, and the goods are sold on a close margin on the average cost per pound, the

YARN TRIAL BALANCE

		Labor			Drugs		
Color	Pounds	Per lb.	Amount		Per lb.	Amount	
C 1	4582	.01144	52	43	.0124	56	82
C 2	171440	.00857	1470	21			
C 2½	9102	.00501	46	56	.0037	628	48
C 4	54784	.00734	402	48			
C D	290587	.0064	1859	96	.0241	8299	46
C C	76060	.00413	314	52			
C B	18171	.00409	74	47	.0193	1516	14
			4178	63		10800	90

FIG. 4.

So we find the cost for drugs per pound as follows:

$21.44 ÷ 800 lbs. = $.0268, cost per pound.

The total cost per pound is $.0338 as follows:

Drugs	.0268 per lb.
Labor	.007 per lb.
Total	.0338 per lb.

It may be said that this involves a great deal of detail and is not worth the trouble, but a trial will convince one that money is saved by keeping a lookout after the costs and knowing just what colors are being dyed and at what cost. Out of a production of, say, 40,000 pounds, 20,000 pounds may be dyed at a drug mill is liable to lose money.

In making up the cost the number of yards to the pound makes a great deal of difference in mill cost. Suppose a color costing the mill 2 cents a pound to dye goes into two-yard goods, the cost is 1 cent per yard for dyeing, where if the same color goes into six-yard goods the cost per yard is only 1/3 of a cent per yard.

The system of cost finding used by one mill on a wide variety of colored cottons was this: Find the cost for weaving, and double it for all other costs. The costs of picking, carding, spinning. warping, dyeing and finishing were all figured by this rule and the cost clerk informed me with evident satisfaction that he could "figure the cost of any fabric inside of five minutes." The result of that method of

cost finding sent the mill into bankruptcy and though other causes may have contributed to put the mill out of business, the chief cause was the fact that the mill authorities guessed at the cost of the goods.

Under the system outlined in this article a loss without the knowledge of those in charge of the mill is impossible, and the amount made or lost on each spindle or loom and each fabric is always known and at all times by referring to the books. Appended to this article is a trial balance sheet of the warp dyeing department of a leading colored cotton mill which shows the variation in cost for drugs and labor that occur in a fancy goods mill, and by looking it over carefully one can see that there is good reason for keeping cost accurately.

SOME CAUSES OF DISCOLORATIONS IN BLEACHED GOODS.

In the June issue of this magazine, I read the remarks on this subject. I think, however, there were a number of practical points omitted, and that discolorations are frequently due to other causes than those given.

Pure water is of course the great essential for bleaching purposes; it ought to be soft and clear and of sufficient quantity.

The water for most bleacheries is drawn from rivers. No adequate means are taken for its filtration, or purification. To attempt to purify so large a volume of water needed for a bleachery would entail too serious an expense for the majority of firms.

There are, however, some filtration plants working more or less successfully in various parts of the country. One in the Newburg Bleachery was described in your last issue. The river being the natural drainage for the country through which it flows, collects so much that unfits it for bleaching purposes, it is surprising that so little is done in the matter of filtration.

Bleacheries were formerly erected at various places with little or no thought being given to the water supply, and so we find some bleacheries supplied with water from ponds almost stagnant, clay pits, from which clay has been dug by the brick maker, and even from salt marshes.

Water from clay pits is often the color of rich cream, and very largely impregnated with iron, lime and magnesia. It is imperative that some attempt at filtration be made in such cases. A wooden trough is made to carry the water into the washer; at the end of the supply pipe a fine wire screen is placed and again a burlap screen.

The water is then forced through these screens by a pump, thus giving a fair, but by no means a perfect water supply.

The worst water is that from marshlands, but the preceding cheap method of filtration makes even water from marshes usable, providing the screens are cleaned often enough, and not allowed to get foul.

In case the water is salty, it may be used to advantage in washing greys, and goods out of chemic for souring. Goods washed from sours into bowking kier with salty water, will need much stronger alkali for scouring purposes.

These are some of the ways we have used to overcome impure and insufficient water supply.

Pure water for bleaching purposes is one of those things bleachers dream about and rarely see. Fall River, Mass., has the most ideal water supply. It is supplied from Watuppa Pond, a never failing source; the more drawn, the more the supply.

Watuppa Pond is fed by a subterranean river that flows from the White Mountains away up in New Hampshire.

During the whole distance at only one or two places does it crop out before it reaches Watuppa Pond. In case the draught from the pond is not large enough, an overflow is said to take place into the bay, and so great is the flow from the subterranean river that fresh water boils up in the bay on occasions.

But there are other causes of discoloration besides those of impure water, which the bleacher must know how to avoid.

The following are some of the causes:—

1st. Filling the kier too full of cloth, so that the cloth is not always immersed during the boiling process.

2d. Failing to give the kier sufficient liquor, or allowing the liquor to escape by too great an opening of the pressure cock. All

high pressure kiers ought to be supplied with sprinklers. In case a kier loses its liquor, by turning on a stream of cold water through the sprinklers, in five minutes the pressure is sufficiently down, to allow a fresh supply of liquor to be added on the top of the cloth. The steam is then turned on again, when the boiling process is resumed without loss of time, or damage to the cloth.

3d. Giving the cloth the chlorine bath, when the cloth has not had sufficient wash to clean it thoroughly from the alkali used in the process of boiling.

4th. If the wash from the white sour or the finishing wash is not thorough and thus leaving a trace of acid in the cloth, the goods are apt to turn a yellowish brown after laying in stock some time. If sulphuric acid has been used in the last sour, the goods generally turn pinkish, changing to a yellowish-brown. Then they are in a tender state. Muriatic acid is the safest to use; being more volatile than sulphuric acid, a great part of it evaporates during the drying process, thus preventing the cloth from becoming tender, also making the cloth more acceptable to the dyer or finisher.

5th. If the cloth has not been thoroughly bottomed, that is, if the natural oil of the cotton, which are of a waxy, resinous nature, and the sizing matter used in the weaving process, have not been made soluble during the scouring process, and washed off before the cloth is given the chlorine bath, the action of the chlorine is apt to be on the surface of the cloth only. That is the meaning of the terms used among bleachers, "not bottomed," and "only a surface bleach."

OLD PRACTICAL BLEACHER.

A SIMPLIFIED METHOD OF DYEING INDIGO.

BY KUTTROFF, PICKHARDT & CO.

A correct idea of the commercial importance of indigo may be gathered from the statement that formerly the value of the indigo annually produced was estimated at $20,000,000 to $25,000,000. This was based upon values which were more than double the present prices.

In 1897 indigo made synthetically by the Badische Anilin & Soda Fabrik was offered in the markets of the world with the gratifying result that the cost of indigo to the dyer has been reduced one-half and the quantity of indigo consumed in the world has materially increased.

At the present time it is safe to say that at least 75 per cent. of the world's total consumption is synthetic indigo.

For many years indigo was considered a difficult dyestuff to handle, especially in small mills. It was necessary to have a large amount of money in grinding machinery and vats. The large number of vats required took up much space. No two lots of vegetable indigo were ever identical, and the dyer who could overcome all of these obstacles and turn out a high grade of work was looked upon with nearly as much awe as were the alchemists of old.

THE REDUCING AGENTS FOR INDIGO ARE:

1. Of a mineral chemical nature or
2. Organic chemical processes are made use of, depending on fermentation brought about by living organisms.

METHOD OF REDUCING.

An outline of the usual method of procedure, when a dyer reduces his own indigo, is as follows:

The indigo is weighed and placed in the tank or container and the caustic soda added with sufficient water to dissolve. The hydrosulphite is then made in a separate tank by mixing zinc dust with bisulphite of soda. This mixture is added to the first, and after stirring 15 or 20 minutes the reduction is complete and the reduced indigo ready to use. In many cases lime is added to the hydrosulphite mixture and the whole is filtered through a filter press. This gives an absolutely pure hydrosulphite at a very low cost.

The amount of sediment which accumulates in most vats is of great detriment. This arises from the zinc, lime and other ingredients used in reduction, even with synthetic indigo, while with vegetable indigo, about 50 per cent. consists of earthy matters of no more value than mud. Except in the case of synthetic indigo with filtered hydrosulphite and the vat mentioned below, which contain

no sediment and may be run for an indefinite period, indigo vats must be renewed or reset every few months, the time varying with the amount of work done.

VARIOUS VATS.

The introduction of synthetic indigo brought about many changes. In the first place, the process of grinding was entirely eliminated and the use of an absolutely uniform product made it possible to obtain corresponding by better results.

Then came the investigation of the old copperas vat, the lime vat and the molasses vat, with the result that the copperas vat is practically obsolete. The molasses or hot vat is used to a very limited extent and in a great many cases the zinc lime vat has been dispensed with. The vat that has taken their places is the hydrosulphite vat. This vat, which is the cleanest and best for cotton, proved to be economical. It was found that two to three times the amount of work could be turned out from one vat than was possible with any other, and the work was better, so that the capacity of a dye-house was doubled or tripled by using synthetic indigo in the hydrosulphite vat in place of the vegetable indigo with the older methods.

INDIGO DYEING SIMPLIFIED.

The manufacturers of synthetic indigo, recognizing that there are many mills that would like to use indigo but are not equipped to reduce indigo and to carry out the usual dyeing process, have prepared

INDIGO SOLUTION B. A. S. F. 20 PER CENT.

This is synthetic indigo reduced with hydrosulphite and contains the same percentage of indigotine as the commercial synthetic indigo in paste form, namely 20 per cent. It is in the proper condition to add directly to the vat without further treatment, or can be diluted if necessary. The hydrosulphite and alkali are also fed directly to the vat. After a few minutes' stirring the vat is ready for use. With the old methods it was found necessary to wait varying periods, from one to five days, before the vat could be used. With the use of indigo solution B. A. S. F. 20 per cent. all the materials necessary to use come in a form all ready to add to the vat, the dyer having only to weigh them out.

As regards cost, it stands to reason that the minimum cost is obtained at mills fitted up for reducing the indigo themselves, while for a small user it would be to his advantage to use the indigo solution already reduced.

METHOD FOR USE IN DYEING COTTON YARN.

It is necessary thoroughly to boil out the yarn before dyeing, to insure even results. In dyeing long chain the larger the vat the better. With short skein, tubs from 100 gallons up may be used according to amount of yarn required to handle. In all cases cotton should be given at least two dips.

In dyeing short warps of fine numbers, it is best to have 1 1/2 to 2 gallons of dye liquor for each pound of yarn.

Vat can be nearly exhausted of indigo by using glue solution. If desired to keep vat after using, it is very easily started again by adding hydrosulphite B. A. S. F. powder with ammonia or caustic soda sufficient to redissolve and reduce the indigo.

Proportion for 100 gallons dye liquor for light shade should be from 2 to 5 pounds of indigo solution.

Medium shades ..... 6 to 8 lbs.
Dark shades ..... 9 to 12 lbs.

For 100 gallons liquor, 3 pounds hydrosulphite B. A. S. F. powder should be added to the vat to take care of air which may be dissolved in water.

For each 100 pounds of indigo solution used, add also

13 pounds caustic soda,

10 pounds hydrosulphite B. A. S. F. powder.

Sufficient hydrosulphite B. A. S. F. powder and caustic soda should be added from time to time to keep vat of a clear amber yellow.

The indigo solution may be added directly to the vat or diluted outside for use according to requirements, as follows: Take

100 pounds indigo solution B. A. S. F. 20 per cent.,

13 pounds caustic soda,

25 gallons hot water, and add while stirring

10 pounds hydrosulphite B. A. S. F. powder.

ADVANTAGES FOR USE IN WOOL DYEING. INDIGO SOLUTION B. A. S. F. 20 PER CENT.

Indigo has long been recognized as pro-

ducing ideal results for stains and medium shades of blue where special fastness to light is required. The introduction of indigo solution has

1. Greatly reduced the cost.
2. Made grinding unnecessary.
3. Improved and simplified the method of dyeing, it being no longer necessary that the dye-house be especially equipped successfully to color with indigo.

The ease with which small quantities of material may be dyed makes it possible to use indigo solution B. A. S. F. 20 per cent. in mills not regularly equipped for indigo work. The class of work turned out will be of superior quality if proper care is taken. There is no sediment in the vat. Tips do not appear if wool is properly scoured and of good quality.

Vat can be nearly exhausted of indigo by using glue solution. If desired to keep vat after using, it is very easily started again by adding hydrosulphite pure powder with ammonia or caustic soda sufficient to redissolve and reduce the indigo.

It is always recommended to have wool properly scoured or cleaned before dyeing, as in most vats insoluble soaps are formed on the wool, due to presence of zinc and lime. In the case of this pure vat, these insoluble soaps are not formed on the wool, and consequently do not prevent the wool from being subsequently clean and easy to finish.

THE TEST FOR INDIGO.

Indigo-dyed fabric may be positively identified by burning a thread on a piece of porcelain. A blue mark, which consists of a thin film of pure indigo, is left on the porcelain (with greenish-blue edge).

A drop of nitric acid produces a bright yellow spot with a slightly greenish ring around it. If indigo has been used in connection with other colors, the nitric acid test is of a different color, with few exceptions. In cotton there is often a bottom of direct blue or black put on before dyeing to cheapen the shade or to get certain dull effects. A bottom of 2 to 4 per cent. copperas is advantageous for dark, dull shades of blue and does not injure the fastness in any way, as does the one of direct or substantive colors.

SUMMARY.

(1) The world's consumption of indigo is increasing because:

(a) Indigo is the standard of governments.

(b) In the dry goods market the reputation and appreciation of indigo is greater than any other known dyestuff.

(c) Among consumers of all classes the guarantee "indigo dyed" is recognized and therefore helpful to the sale of the goods.

(2) The identification of indigo, both on cotton and wool, is easy and effective.

(3) Those who have always used indigo find every reason to continue and no reason to discontinue its use.

(4) Those who have never used indigo on account of complications in the process have now an opportunity of doing so and under conditions so simple that indigo can justly be claimed to be within the reach of all.

THE NEW DYER.

That knowledge comes but wisdom lingers must be the feeling of many a follower of the tinctorial art as he finishes a short period of probation and perturbation in some position where the stars in their courses have fought against him. The dyer is the cook of the textile establishment, often feared, mistrusted and misunderstood. The successful discharge of his various duties calls for good judgment and quick apprehension quite as much as knowledge and experience. Generally the full weight of his department falls upon the new dyer's shoulders the minute he enters the mill. He steps on a treadmill where his mental stock in trade is liable to be paralyzed by the whirling of spindles and the clanking of looms. He has not time to stop and think and experiment. The whole mill is waiting for him to turn out work in bulk. Spindles and looms may run on for a time by their own impetus but not the dyehouse.

The new dyer cannot make a clean sweep of men and methods without danger of throwing the whole line of processes into confusion. His predecessor has, doubtless, carried off all the recipes and his own are impaired materially in value unless he has the same colors he has been using, for in the

thousand and one brands of aniline on the market today it is ten to one he finds any in stock which fit in with his own favorites.

The course usually followed is mainly a matter of temperament. Some fall on Scylla and some on Charybdis. One class of dyers call at once for their own line of colors and introduce a friend as second hand. The other class try to worm out how the work was done by their predecessors from the man of many summers usually found in every dye house, who has seen dyers come and dyers go and has never had the courage or the opportunity to step into their places.

With the colors the new dyer has used previously the shades are matched apparently to perfection, but different methods of preparing and finishing may alter them to such an extent that the final result is so different to that obtained previously as to alter entirely the character of the finished product. If he essays to use the dyes in stock he possibly overlooks some little trick in mordanting or temperature and the result is still unsatisfactory. If time permits, of course it is wise to make experimental dyeings on a small scale, but time is seldom afforded at the start when it is most needed by the dyer. There are ten thousand different ways of making tribal raids in Mandalay, as Kipling sings, and of course the strong, self-centered dyer takes his courage in both hands and produces the required result from almost any assortment of dyes if they are of the right character. My remarks are not intended for these exceptional men—they are seldom placed in the position of seeking to establish themselves in a new and strange environment. They are sought because of their excellence in some definite class of work to do the same work, perhaps on a larger scale.

It is not easy to give advice to the young and ambitious dyer who wishes to enlarge his experience. For the slattern and the sluggard we have no word. Undoubtedly the majority of dyers seeking positions are too free in their claims. How frequently we profess proficiency in dyeing "wool, worsted and cotton yarns, raw stock, silk noils, woolen worsted, mixed and cotton piece goods, bleaching, mercerizing, etc." Of course the fault is not all on the side of the dyer. The requirements of many American mills are very exacting and diverse, and there is often difficulty in securing a good man who has had just the various experiences their work calls for. The agent must decide sometimes between the inefficient man who has just filled a post on all fours with theirs, and the intelligent man who lacks direct experience in some one point. Here comes the latter's opportunity of enlarging his experience and improving his position. He must take chances. This is in the interest of all concerned as the textile trade is constituted here. He must trust his judgment that the odds are not too many for him.

I once knew a dyer who took a position for which he was not qualified by any actual previous experience. He did not conceal this from the agent. The work was easy and, granted a reasonably amount of leeway, he could have filled the post well and improved the character of the goods. The start was propitious. The man who was responsible for passing the work, lulled into security by the excellence of the last dyer's work, let matters slide. Then came one blunder after another on his part. A batch of goods dried up a dozen shades darker than the sample he matched them to. Salt colors, which according to all the canons of dyeing should come level, were entered too hot and turned out as "uneven as a horse's head." A rather excusable confusion about the quantity of dye for shade set him seeking all sorts of reasons why apparently the same amount of color most carefully weighed produced such diverse results. The solution came too late. Several simple tints looked cloudy. He knew they were being dyed exactly as before, as far as he went, but he had overlooked one little expedient quite peculiar to this class of work. One confessedly difficult shade he had put off dyeing day by day till he got on his feet. His foreign help smilingly nodded to his instructions and as soon as his back was turned frequently did just the wrong thing. It takes time to invent signs and signals in such a case.

Now all was changed. The goods inspector would pass nothing, everything was pronounced faulty, looms began to stop, the agent got frightened and time was up. As

a practical man he knew the faults he had committed would be excusable by anyone acquainted with a dyer's difficulties, that they were all remediable most easily and had only to be pointed out to be quickly overcome by any intelligent dyer. What he did not know was the necessity of acquiring the "fault sense" immediately he entered upon his duties. This forms the chief danger to even a good all round dyer in taking up new and strange classes of work. The difficulty of the dyes is great, but this is greater. Under conditions in this country a dyer must know when his work is wrong. This seems a distinction without a difference, but it constitutes a real call upon the dyer's experience and ability here. It is rather the exception of the superintendents or the overseers who have to use the dyer's work to have any practical knowledge of dyeing, so that faults which would be recognized and excused and remedied in a commission dyehouse bring distrust and dissatisfaction and dismissal in a mill for many a dyer, who if given time would prove a valuable addition to the staff. Here comes the rub. Time cannot always be given. The spindles and the looms can seldom wait at the start for the dyer's brain to turn out the best product.

In conclusion it cannot be too strongly impressed upon the mind of a dyer entering upon work which is new to him, not to trust too much upon the "color sense" and "mending sense", but to acquire with all speed the "fault sense" of the particular class of goods he has to deal with. Of course this is only another way of saying that the dyer must understand the various uses to which his work is to be put, and this variety of uses is greater than the ordinary dyer has any conception of. Thus a dyer of cotton yarn may not be the dyer of cotton yarn the mill really required, and whatever his ability and general experience he may not have the good judgment and quick apprehension required to become the dyer of cotton yarn in time to hold his position.

This may seem rather a dark picture, but it refers only to the first few weeks of many an average dyer's time in a new position. When settled his duties and responsibilities are in no way more onerous than those of any other overseer, and few branches of the textile trade can compare with dyeing in interest and chances of intelligent improvement.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 97.

Garnet on Worsted Yarn.

Ortho Cerise B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Ortho Cerise B.
(Berlin Aniline Works, 215 Water St., New York.)
25 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., raise to a boil and dye at a boil for 1 1/2 hours.

Ortho Cerise B possesses extraordinary fastness to light. Also good fastness to steaming, ironing, rubbing and perspiration, but its fastness to milling is less good. Cotton threads are scarcely stained by it.

Recipe No. 98.

Dark Green on Worsted Yarn.

Ortho Cyanine 6 G on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Ortho Cyanine 6 G.
(Berlin Aniline Works, 215 Water St., New York.)
25 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., raise to a boil and dye at a boil for 1 1/2 hours.

Ortho Cyanine 6 G possesses extraordinary fastness to light. Also good fastness to steaming, ironing, rubbing and perspiration, but its fastness to milling is less good. Cotton threads are scarcely stained by it.

Recipe No. 99.

Yellow on Worsted Yarn.

Sulphon Yellow R on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Sulphon Yellow R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter the yarn at 140° F. and dye at a boil 1/2 hour.

Then add

4 lbs. Sodium Bisulphate,

and boil 1/2 hour longer.

Sulphon Yellow R produces very clear yellow shades, possesses excellent fastness to milling and is of special value in the dyeing of loose wool, slubbing and yarn. It is, also, well adapted for the printing of wool, silk unions, and pure silk.

Recipe No. 100.

Black on Cotton Yarn.

St. Denis Autogene Black 2 B on 100 lbs. cotton yarn. Prepare the dye bath with

15 lbs. St. Denis Autogene Black 2 B.
(Walter F. Sykes & Co., 85 Water St., New York.)
15 lbs. Sodium Sulphide Crystals.
10 lbs. Soda Ash.
100 lbs. Common Salt.

Enter yarn at a boil. Dye at a boil 3/4 of an hour, then wash and dry.

The above amounts refer to the first bath. In the standing bath the quantities may be reduced, as follows:

8 lbs. St. Denis Autogene Black 2 B.
7 lbs. Sodium Sulphide Crystals.
3 lbs. Soda Ash.
25 lbs. Common Salt.

St. Denis Autogene Black 2 B is a new sulphur black giving fast full shades without the necessity of after-chroming.

Recipe No. 101.

Yellow on Cotton Yarn.

Cross Dye Yellow G on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Cross Dye Yellow G.
(Read Holliday & Sons, Ltd., 7 Platt St., New York.)
2 lbs. Crystalline Sulphide, or
1 lb. Rock Sulphide.

If more sulphide is used the shades will be slightly greener.

Cross Dye Yellow G is fast to light, milling and bleaching.

Recipe No. 102.

Cutch Brown on Cotton Yarn.

Immedial Cutch R on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Immedial Cutch R.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Sodium Sulphide Crystals.
5 lbs. Sodium Carbonate.
80 lbs. Glauber's Salt, Crystals.

Be sure the dyestuff is thoroughly dissolved.

Enter yarn just below the boil and dye one hour at this temperature, keeping it below the surface of the liquor as much as possible.

The amounts given above are for the first dye bath. In a standing dye bath the amounts are as follows:

7 lbs. Immedial Cutch R.
6 lbs. Sodium Sulphide Crystals.
1 lb. Soda Ash.
2 lbs. Glauber's Salt Crystals.

Immedial Cutch R possesses excellent properties of fastness and is a valuable substitute for cutch in all the branches of cotton dyeing. By using it in combination with other immedial colors a great variety of shades may be produced. On account of its good solubility it is well adapted for machine dyeing.

Recipe No. 103.

Black on Worsted Yarn.

Chrome Acid Black R on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Chrome Acid Black R.
(A. Klipstein & Co., 122 Pearl St., New York.)
10 lbs. Glauber's Salt.
10 lbs. Acetic Acid.

Boil one hour and add

2 lbs. Sulphuric Acid.

Continue the boiling 1/2 hour longer and add

2½ lbs. Potassium Bichromate.

Then boil one hour longer. Wash and dry.

Chrome Acid Black R possesses excellent fastness to washing, steaming, perspiration and light. It leaves cotton yarn white.

Recipe No. 104.

Crimson on Cotton Yarn.

Tetrazo Chlorine Scarlet 3 B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Chlorine Scarlet 3 B.
(American Dyewood Co., 156 William St., New York.)
25 lbs. Common Salt.

Dye yarn at a boil for one hour.

Tetrazo Chlorine Scarlet 3 B is faster to light than the ordinary direct cotton reds. Its fastness to acids is also somewhat better. On account of its level dyeing properties it is of special interest for shading purposes.

Recipe No. 105.

Violet on Worsted Yarn.

Ortho Cyanine B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Ortho Cyanine B.
(Berlin Aniline Works, 215 Water St., New York.)
25 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., raise to a boil and dye at a boil for 1 1/2 hours.

Ortho Cyanine B possesses extraordinary fastness to light. Also good fastness to steaming, ironing, rubbing and perspiration, but its fastness to milling is less good. Cotton threads are scarcely stained by it.

Recipe No. 106.

Crimson on Worsted Yarn.

Fast Crimson C S on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Fast Crimson C S.
(Thomas Leyland & Co., 53 India St., Boston.)
2 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter the yarn cold, raise dye bath to a boil and dye at a boil for one hour.

Fast Crimson C S is a very level dyeing acid color possessing good fastness to light and stoving and is of value in the production of combination shades.

Recipe No. 107.

Black on Cotton Yarn.

Thiogene Black M M Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

11 lbs. Thiogene Black M M Conc.
(H. A. Metz & Co., 122 Hudson St., New York.)
33 lbs. Sodium Sulphide Crystals.
10 lbs. Soda Ash.
50 lbs. Common Salt.

Be sure that the dyestuff is thoroughly dissolved before entering the yarn.

Enter the yarn just below the boil and dye at this temperature for one hour.

The above amounts apply to the first dye bath. For a standing bath the following amounts only are necessary:

7 lbs. Thiogene Black M M Conc.
14 lbs. Sodium Sulphide.
2 lbs. Soda Ash.
3 lbs. Common Salt.

Thiogene Black M M Conc. possesses excellent fastness and the blacks produced with it resemble very closely an aniline oxidation black.

Recipe No. 108.

Blue on Cotton Yarn.

Immedial Indone B N on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Immedial Indone B N.
(Cassella Color Co., 182 Front St., New York.)
8 lbs. Glucose.
16 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
40 lbs. Glauber's Salt, Crystals.

Enter at a temperature just below a boil and dye at that temperature one hour.

Immedial Indone B N possesses the excellent fastness characteristic of the other sulphur blues and when used as a self color or in combination with other immedial blues exceedingly fine shades resembling indigo blue may be produced.

The above amounts are for the first bath. In the standing bath they may be reduced.

Recipe No. 109.

Scarlet on Worsted Yarn.

Fast Scarlet C S on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Fast Scarlet C S.
(Thomas Leyland & Co., 53 India St., Boston.)
2 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter the yarn cold, raise the dye bath to a boil and dye at a boil for one hour.

Fast Scarlet C S is a very level dyeing acid color, possessing good fastness to light and stoving and is of value in the production of combination shades.

Recipe No. 110.

Green on Cotton Yarn.

Chlorazol Brilliant Green B on 100 lbs. bleached cotton yarn. Prepare the dye bath with

2 lbs. Chlorazol Brilliant Green B.
(Read Holliday & Sons, Ltd., 7 Platt St., New York.)
30 lbs. Common Salt.

Dye one-half hour at the boil.

Chlorazol Brilliant Green B possesses very good leveling and calendering properties, and is reasonably fast to light and washing. On mercerized cotton the shades come up much yellower.

Recipe No. 111.

Scarlet on Cotton Yarn.

Tetrazo Chlorine Scarlet B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Chlorine Scarlet B.
(American Dyewood Co., 156 William St., New York.)
25 lbs. Common Salt.

Dye yarn at a boil for one hour.

Tetrazo Chlorine Scarlet B is faster to light than the ordinary direct cotton reds. Its fastness to acids is also somewhat better. On account of its level dyeing properties it is of special interest for shading purposes.

Recipe No. 112.

Blue Black on Cotton Yarn.

Katigen Blue Black N B Extra on 100 lbs. cotton yarn. Prepare the dye bath with

16 lbs. Katigen Blue Black N B Extra.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
32 lbs. Sodium Sulphide, Crystals.
8 lbs. Soda Ash.
50 lbs. Common Salt.

Enter at a boil and dye at a boil for one hour. Rinse quickly, wring and dry.

Katigen Blue Black N B Extra gives a full and excellent shade of blue black which possess good fastness to all the common color-destroying agencies.

In 1904 the Chinese Empire bought from the United States 248,671,197 yards of cotton cloths, valued at $13,911,566, more than ten times the quantity sold to any other country.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Acworth. The Acworth Cotton Mfg. Co., now erecting a new plant, contemplates operating same by electricity and if so will transmit same through the mill by motors.

*North Carolina, Spray. Contract for bricks for the new plant to be built by the German-American Co. has been let. Plans for the new building will soon be ready. This plant will be equipped with 12,000 spindles and 360 looms for making three-yard brown goods.

*Pennsylvania, Sellersville. Contract has been let for the erection of the new building for the Tapestry Mills Co., which will remove their plant from Philadelphia to this place. The main building will be 150 by 50 feet, with engine house, 49 by 50 feet, and dye house, 100 by 50 feet.

*Rhode Island, Washington. The Elite Spinning Company, which has leased mill at this place, is running plant on custom and commission twisting. They operate 480 mule spindles. J. Howard Dews is treasurer of the company, and W. L. Truedell, agent.

*South Carolina, Iva. The Jackson Mills have been organized and the stock, placed at $200,000, has all been subscribed. It is expected to have the mill ready to start production before end of the year. D. P. McBrayer and W. P. Cook are prime movers in the enterprise.

*South Carolina, Lockhart. At special meeting held by the stockholders of the Lockhart Mills, it was voted to increase the capital stock to $1,300,000. The new mill, under construction at this place, will be equipped with 50,000 spindles and 1,500 looms. When completed the company will have a total of about 78,000 spindles in operation. Brown sheetings are made and sold through Deering, Milliken & Co.

South Carolina, Welford. The Jordan Manufacturing Co. is the name of the new concern which will start up here on July 1st with 15 looms which they will operate on quilts, bed spreads, etc., using cotton yarns of low numbers.

Enlargements and Improvements.

Alabama, Anniston. The Woodstock Cotton Mills now manufacture Turkish towels and damask tablecloths. A new addition, 300 by 50 feet, has been built and is being equipped with 175 new looms.

The W. A. Handley Mfg. Co., Roanoke, Ala., have adopted the American Moistening Company's system of humidification.

Alabama, Talladega. Mr. C. M. Plowman, secretary of the Chinnabee Cotton Mills, recently in Philadelphia, reports that their mills are very busy on hosiery yarns 12's to 18's on cones which they are turning out on 3,600 spindles. It is the intention of this company at some time in the near future to increase their plant to almost double its present capacity.

Georgia, Atlanta. The Scottdale Mills have recently completed making improvements to the plant, including installation of some 30 new looms.

Georgia, Dublin. The Dublin Cotton Mills will largely increase the plant. A new addition will be built and some 3,100 spindles with looms will be added.

Georgia, Harmony Grove. Extensive additions are being made to the Harmony Grove Mills. Orders have been placed with the Howard & Bullough American Machine Co. for picking, carding, drawing machinery, speeders and spinning frames.

Georgia, Toccoa. The Toccoa Cotton Mills have placed an order with the Kilburn Lincoln Co. for 40 forty-inch looms.

Massachusetts, Adams. The Renfrew Manufacturing Company will erect a new dye house, 186 by 70 feet, and a drug room, 47 by 47 feet.

The Renfrew Manufacturing Company, Adams, Mass., have placed a repeat order with the American Moistening Company for two of their "Aerophor" fabric dampeners.

Massachusetts, Adams. W. C. Plunkett & Sons are to make improvements to their plant. The old dyehouse will be remodeled for a storehouse and the present storehouse will be torn down and a new dyehouse erected on site. The new building will be about 115 by 40 feet, brick.

The Paul Whitin Mfg. Co., Northbridge, Mass., have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

Massachusetts, East Webster. A three-story addition is being built to the Cambric Works.

Massachusetts, Lawrence. The Pacific Mill Corporation is installing 800 new Draper (cotton) looms in the plant, replacing old ones.

The Massachusetts Mills, Lowell, Mass., have placed a repeat order for humidifiers with the American Moistening Company.

North Carolina, Burlington. The Elmira Cotton Mills have recently installed some 400 new looms.

The Lakeview Mfg. Co., Fayetteville, N. C., have placed an order for humidifiers with the American Moistening Company, Boston, Mass.

North Carolina, Burlington. The Glencoe Cotton Mills have installed 100 new looms in the plant.

The E. L. Shuford Mfg. Co., Hickory, N. C., are equipping their mill with humidifiers, adopting the American Moistening Company's system.

North Carolina, Graham. The Carolina Cotton Mills have completed an addition, 124 by 50 feet, also installation of 71 duck looms.

North Carolina, Henderson. Contract has been awarded by the Henderson Cotton Mills for two new boilers, one engine and additional cards and mules to be installed in the plant.

The Maysville Cotton Mills, Maysville, Ky., have adopted the American Moistening Company's system of humidification.

*North Carolina, Spray. Work will start at once on erection of new addition, 100 by 200 feet, for the Rhode Island Company, in which additional looms will be installed. It is probable that a 500 h. p. steam engine and dynamo will also be put in for lighting purposes.

North Carolina, Wilson. The Wilson Cotton Mills have placed order with the American Moistening Co., Boston, Mass., for their system of humidifiers.

Pennsylvania, Philadelphia. The Kensington Hair Cloth Co., now located at Mascher and York Sts., it is reported, have leased the old raw-hide factory at Nicetown Lane and Kensington Ave., into which they will move within a short time. The concern is now very busy, running their looms at night, and their removal is due to need of more room.

*Pennsylvania, Philadelphia. Plans for the new Bromley Lace Mill at 22d Street and Lehigh Avenue, are now being prepared, the first one consisting of a finishing building, 76 by 144 feet, having been filed. The first floor will be reinforced concrete and the upper floors of slow burning mill construction type. It is also said that work will be started on the one-story boiler house and power plant which will be 51.6 by 107 feet at once.

Pennsylvania, Philadelphia. Plans are being perfected by the John Mawson Hair Cloth Co. for an addition, 50 by 50 feet, three stories, to be built to the mill. Additional machinery will be installed, increasing capacity of plant with 72 serge and 20 hair cloth looms.

*Pennsylvania, Philadelphia. The Aberfoyle Manufacturing Co., of Chester, Pa., which was reported as having purchased the Clayton W. Rice mills, at this place, will run plant on cotton and silk mixed fancy dress goods. The mills are being equipped with 200 looms and will be put in operation shortly. W. T. Galey will be manager.

Rhode Island, Anthony. The Quidnick Manufacturing Company is making extensive alterations and additions to the plant. They are now installing Howard and Bullough speeders and spinning frames.

Rhode Island, Coventry. Earl A. Potter & Co., of Auburn, R. I., have leased one of the idle Peckham Mills and will remove plant to same. About 25 people will be employed.

Rhode Island, Pawtucket. The Lorraine Manufacturing Company has started work on enlarging the plant. They will build an addition, 100 by 90 feet, four stories, to the main cotton mill, a new weave shed, 110 by 90 feet, one story, brick, a new office building and a warehouse, 100 by 80 feet, for storage purposes. About 400 looms will be installed in the new weave shed and the spindles increased to 25,000.

Rhode Island, Pawtucket. The Jenckes Spinning Company is erecting a new building, 200 by 50 feet, four stories. They will install 10,000 spindles and complimentary machinery for making fine combed yarns, principally Sea Island, from 80s to 120s.

The Manville Company, Woonsocket, R. I., have placed a large order for humidifiers with the American Moistening Company, Boston, Mass.

South Carolina, Central. The Isaqueena Mills have placed an order for 350 of the Kilburn, Lincoln Co.'s looms.

South Carolina, Charleston. At the annual meeting of the stockholders of the Royal Yarn & Bag Manufacturing Company held recently, it was decided to enlarge the plant. An additional mill will be erected for manufacturing bags in general, and the present plant for making seamless bags and osnaburgs will be enlarged.

*South Carolina, Fountain Inn. The Fountain Inn Manufacturing Co. advises us that they will add 4,500 spindles to the plant, making a total of 10,000 spindles. They will also put in 60 72-inch Jacquard looms.

The Aiken Manufacturing Company, Bath, S. C., have placed a repeat order for humidifiers with the American Moistening Company.

*South Carolina, Pacolet. The Pacolet Mfg. Co. has recently placed their order for the complete equipment of their new No. 5 mill in Saco & Pettee Machine Shops of Newton Upper Falls, Mass.

*South Carolina, Woodruff. The Woodruff Cotton Mills advise us that they are only adding a few additional spindles to the plant. When completed they will have a total of 37,000 spindles and 750 looms.

Mills Starting Up.

*Alabama, Rock Mills. The Wehadkee Yarn Mills have been incorporated with capital stock of $25,000 to operate the plant reported purchased recently by L. Lanier. N. L. Atkinson and L. S. Turner are also interested.

Delaware, Wilmington. The Delaware Cotton Co., which has been idle for the past year, has received orders sufficient to run the mills in full, and has started up manufacturing fancy cotton and mercerized dress goods, madras shirtings, etc. The goods are now sold through R. A. Whytlaw, Son & Co., 350 Broadway, New York, who have been very successful in obtaining orders for the company. The mill will be run mainly on madras cloths for ladies' wear. Benj. O. Race is the general manager.

*Massachusetts, Franklin. We have been advised that there is a prospect of the plant formerly operated as the Worcester Textile Co. resuming operations under name of the Franklin Mills. They will make same class of goods as before. Benj. Laycock will resume his position as superintendent of the plant.

*Massachusetts, New Bedford. The new Kilburn Mill is just being started up. The Saco & Pettee Machine Shops furnished their latest improved revolving flat cards and drawing frames for this mill.

Pennsylvania, Philadelphia. Francis A. Bruner, who recently went out of business on account of financial troubles, is about to start up a plant at 1926 to 1930 E. Boston Avenue, where he has rented the third floor and in which he is installing six looms to be run on upholstery goods.

*Rhode Island, Woonsocket. Operations have been resumed in the plant of the National Pile Fabric Co. by Mr. Maertens, the lessee.

*Tennessee, Nashville. The Tennessee Manufacturing Company has started operations after idleness of some time.

WOOLEN.

New Mills.

Maine, Waterville. It is reported that Edward Chase, formerly superintendent of the Chase Manufacturing Co., has purchased the property formerly owned by Charles Priest, of Winslow, including a fine water privilege, and contemplates installing a shoddy plant. The mill is to be run on an independent basis, and will do some custom work.

Maine, Waterville. The Smith Woolen Company is new concern reported incorporated with capital stock of $130,000, for purpose of manufacturing cotton and woolen goods. Ralph M. Gilmore is president of the company and Lewis G. Whipple, treasurer.

*Massachusetts, Monson. The Branch Woolen Mills, recently reported to be taken over by H. G. Lancey, are now being operated by the Somerset Woolen Company. Thos. G. Lancey is president of the company; Henry Sewall, treasurer, and Henry W. Savage, superintendent. They make woolens, operating 4 sets cards and 20 broad and one narrow looms. Goods are dyed and finished at the mill and sold through Faulkner, Page & Co., New York and Boston.

*North Carolina, Kernersville. The Crews Manufacturing Co., recently reported incorporated with capital stock of $10,000, with privilege of increasing to $50,000, will manufacture blankets. Thomas A. Crews is president of the company, and J. W. Crews, secretary and treasurer. Goods are sold through E. H. Hamilton & Co., New York, and Gilmer Bros. Co., Winston-Salem, N. C.

Pennsylvania, Philadelphia. The Rockwell Manufacturing Co., with a capital of $200,000, is about to be incorporated, the officers to be George Sidebotham, president; and Paul Uhlig, treasurer. This company is now doing business under the name of the Abott Manufacturing Co., which recently started up at Mascher St. and Lehigh Ave. on men's wear worsteds. They have now removed to the north-west corner of Hancock and Somerset Sts., where they are operating 10 looms and getting ready to install others. They are very busy. George Sidebotham will be the superintendent and buyer.

Pennsylvania, Philadelphia. William Jameson, formerly connected with the Baker Mfg. Co., and R. F. Kennedy, under the name of Jameson & Kennedy, have recently taken over and are now operating the Baker weaving plant at Church Lane and Lena Street, which they are running on worsted and cotton goods, men's and women's wear with 15 looms, Mr. Jameson superintending and buying for the plant. They are very busy and state that they are also prepared to manufacture horse blankets, shawls and lap robes when the opportunity offers. The goods are sold through New York.

Enlargements and Improvements.

Connecticut, Central Village. The Plainfield Woolen Company's plant will be equipped with 40 additional looms, thereby increasing the present capacity. This plant was recently secured by J. E. Fletcher.

Connecticut, Moosup. Eighty-five new looms are to be installed in the Moosup Mills replacing old ones and are expected to arrive soon. They will also put in 3 new sets of cards and 6 mules.

*Connecticut, Putnam. The Bay State Worsted Company has started operations making fancy woolens in the Putnam Woolen Company's mill. They operate 32 looms. D. O'Connell is superintendent of the plant.

Connecticut, Rockville. The Jas. J. Regan Manufacturing Company is reported as contemplating extensive improvements to the plant. A new building, 100 by 80 feet, four stories, is proposed.

Connecticut, Stafford Springs. Contract has been let by the Fabyan Woolen Co. for building new store house to replace one recently destroyed by fire.

*Georgia, Rossville. The Park Woolen Mills expect to start operations in about 60 days in their new addition, making warps, 2 plys and single.

Maine, Dexter. A number of new looms are being installed in Amos Abbott & Co.'s plant. They will also start work soon on a new dye house.

Maine, East Madison. The Somerset Worsted Mills are installing six new looms in the plant and contemplate putting in about six more.

Maine, North Vassalboro. The American Woolen Co. is installing ten sets of cards in their mill at this place.

*Massachusetts, Auburn. The Ettrick Mills have a large two-story mill under construction with two wings of one story each. It is expected to have same completed by Aug. 1st. From 15 to 50 new looms will be installed.

Massachusetts, Blackstone. The Saranac Mill is to increase capacity of the plant by installing a number of new Crompton-Thayer looms.

Massachusetts, Cherry Valley. E. D. Thayer has installed 16 new looms in the plant.

Massachusetts, Collinsville. The Beaver Brook Mills are installing six sets of cards and 12 new mules. This will replace some old machinery.

Massachusetts, Franklin. The Franklin Yarn Mills have recently installed one set of cards and will also add three new mules.

Massachusetts, Indian Orchard. The Rhode Island Worsted Co., now operating 62 looms, has placed an order for 40 more, which will be installed as soon as possible.

*Massachusetts, Lawrence. Walworth Bros. have recently installed 24 new looms in the plant.

Massachusetts, Millbury. Work has been started on foundation for addition to be built to the Bowden Felting Mills. The building will be 68 by 30 feet, one story and will be used for scouring purposes.

*Massachusetts, North Andover. The Brightwood Manufacturing Company, which has new addition to the plant well under way, will have a total of 150 looms when additional machinery has been installed.

Massachusetts, Uxbridge. The Stanley Woolen Company is making a number of changes in its plant at Calumet Village and will install a new set of cards among other improvements.

*Massachusetts, Uxbridge. The C. A. Root Co., Uxbridge, Mass., recent purchasers of the Waucantuck Mill in Wheelocksville, has through its treasurer, C. A. Root, received plans and specifications for the proposed new additions to the mill, and the contract will be let out and the building started about July 1. The building will be a two-story brick structure, with modern prism glass windows on the sides and roof.

*Massachusetts, Uxbridge. The American Woolen Company is thoroughly overhauling the Hecla Mill. A new one-story brick packing and shipping room, 50 by 50 feet, and new brick tower with elevator, will also be built. They will install 12 new sets of cards and 18 mules.

Massachusetts, Worcester. Plans are being prepared by M. J. Whittall for a new building, 104 by 62 feet, six stories, to be used for storage and wool sorting.

*Michigan, Sault Ste Marie. The branch plant of the Petosky Rug Mfg. Co., Ltd., at this place, has been incorporated as the Soo Rug Mfg. Carpet Co., Ltd., with capital stock of $10,000. A. T. Washburn is treasurer of the company and Elmer Ashorn, superintendent. Plant is equipped with 10 looms.

New Hampshire, Guild. Ten looms have been started up in the new addition to the Granite State Mills. Other machinery will soon be placed in operation.

New Jersey, Somerville. The Laurel Manufacturing Co., which recently started business here, is doing a large business under the superintendency of F. Wink, who is well known to the textile trade. Many improvements are to be made to this plant in the near future in the way of machinery, etc. They are operating 60 looms on worsted men's wear and dress goods, which are sold direct.

New Jersey, Passaic. It is reported that the Botany Worsted Mills contemplate building a large addition, at cost of about $50,000, for spinning purposes only.

Pennsylvania, Listonburg. Cook, Emert & McMillan are now operating the plant formerly run by Jesse Liston. Woolen yarns, blankets and flannels are made, also shirts. Mill is a one set plant with four looms. This plant will be operated separately from the other Cook mill at Somerset.

*Pennsylvania, Philadelphia. Work has been about completed on the additions to the Shackamaxon Worsted Company. Six of the 24 looms to be added have been installed and the others are expected shortly.

Pennsylvania, Philadelphia. John Gays Sons, Inc., manufacturers of ingrain carpets on 201 looms, have just purchased from the Pilling Manufacturing Co. the building in which they are manufacturing women's knit underwear at Trenton Avenue and Ann Streets. The new owners will take over the building August 1st and install in it new machinery for the manufacture of 3/4 tapestry carpets, velvet carpets and rugs. The Pilling Co., it is said, will remove their machinery to other quarters in the vicinity of Trenton Ave. and Huntingdon St.

Pennsylvania, Philadelphia. The Empire Cloth Manufacturing Co. are installing 10 new looms, which now almost completes their equipment of 20, which they are operating on cloths for men and women's wear and rain cloths. William Barras, the president and general manager of the mill, reports that they are very busy. The plant is located in the Empire Mills at Kensington Avenue and Harold Sts.

Pennsylvania, Philadelphia. The Penhirst Mills, operating plant at 62d Street and Baltimore Avenue, making wool carrier cloth and roller covering, contemplate increasing the capacity of the picker department shortly.

Pennsylvania, Scranton. An addition, 40 by 60 feet is to be built to the Lackawanna Mills, for a picker room.

*Tennessee, Cleveland. The Cleveland Woolen Mills advise us that they have started work on rebuilding their plant recently damaged by fire and contemplate resuming operations within 40 days, with same capacity as before the fire. They propose doubling capacity this summer and are making this addition at same time as rebuilding the destroyed part.

Tennessee, Knoxville. An addition is being built to the weave shed of the Knoxville Woolen Mills, to be used as pattern and designing room. They are considering substitution of an electric drive for the present rope drive.

Mills Starting Up.

*Connecticut, Danielson. The Pequot Worsted Company has started operations.

*Kansas, Topeka. The Topeka Woolen Mills will resume operations July 1st. J. F. McAfee will be general manager of the plant, which will operate under name of the Herschberger-McAfee Woolen Mills Co., at first proposed to locate at Kansas City.

Mills Shutting Down.

Massachusetts, Lowell. The Middlesex Woolen Mills have been closed until August. Extensive repairs are to be made to the boilers during the shut down.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Jewett City. The work is progressing on erection of the Jewett City Textile Novelty Company's new mill.

*Georgia, Augusta. The new silk plant established here by the Singleton Silk Co. will start operations July 10th.

*New Jersey, Paterson. Shelden & Leach, recently reported to start operations here, have an equipment of 20 wide looms. John Sprich, with Rusch & Co., New York, will be the selling agent.

New Jersey, Paterson. The Great Eastern Silk Co. is a new company recently started at 203 Market Street. They have an equipment of 7 warpers and 6 winders for warping and winding on commission.

*New Jersey, Paterson. The American Silk Manufacturing Co. has started operations in their plant in the Congdon Mills, making silks, taffetas, peau de soies, etc. Plant is now equipped with 42 looms and electric power. Capital stock is $10,000. M. Bernstein, president; J. Bernstein treasurer, and Meyer Wolf, superintendent. Goods are sold

through M. Bernstein & Sons, 94 Greene Street, New York.

New Jersey, Paterson. The Manhattan Silk Company will soon start operations in the Todd Mills, corner Jackson and Taylor Streets, long idle. Operations will be started with 83 looms about August 1st. Wm. J. St. Lawrence is agent for the new concern.

*New York, Canisteo. Work is progressing on the new silk mill. It is expected to have the building ready for occupancy July 1st.

Pennsylvania, Allentown. Operations will start July 1st by the Unity Silk Co., recently reported capitalized to operate a mill here. Company has capital stock of $100,000; W. R. Yeager is president of the concern; Leo Schimpff, treasurer, and Geo. Bitzer, superintendent. They will manufacture broad silks, operating 100 looms and use water power. Goods will be sold through John Sprich.

Pennsylvania, Bangor. It is reported that the Crown Silk Co., a new concern, will locate its plant at this place. Company will be capitalized at $50,000 and will make silk gloves. Work will be started shortly on erection of a new building, 100 by 40 feet, two stories, with dye house, 40 by 40 feet. Jacob Raub and Dr. Elwood Hay of Easton are interested.

*Pennsylvania, Catasauqua. Work has been started on erection of the new building for the Corty Velvet Company, recently reported incorporated with capital stock of $50,000. Eden Corty (Crefeld, German), is president of the company; W. Bucholz, treasurer; Wm. H. Elliot, assistant treasurer. They will make silk velvets, selling product through F. Hoeninghaus, 475 Broome St., New York.

Pennsylvania, Jessup. Contract has been let by Valentine Bliss for erection of a new silk mill at this place. The building will be 100 by 50 feet. When completed the present mill at Peckville will be discontinued.

*Pennsylvania, Olyphant. Work is progressing on the new silk mill. The main building is 142 by 50 feet.

*Pennsylvania, Philadelphia. The Oxford Silk Mills, recently incorporated and started up in this city, are now in full operation running 30 looms and auxiliary machinery on ribbons, which are sold through New York. Mr. E. Scherr, prominently identified with the silk weaving business in this city, is the manager and superintendent. The plant is located on the third floor of the Oxford Mills at Front and Oxford Sts.

*Pennsylvania, Towanda. Work is progressing on the new plant of the Towanda Silk Mill. Work of installing machinery will be started in about 10 days

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Mills Starting Up.

*Pennsylvania, Kutztown. Operations have been started in the Kutztown Silk Mill, now controlled by the York Silk Company. Albert Missbach is superintendent of the plant.

Mills Shutting Down.

Massachusetts, Florence. The Nonotuck Silk Company will close the plant from July 1st to the 10th. During shut down a new boiler will be placed and other repairs made.

MISCELLANEOUS.

New Mills.

*Georgia, Athens. Work is well under way on the new linen mill for the Southern Manufacturing Co. It is expected that the plant will be ready to start operations early in the fall.

*Massachusetts, Fall River. The Linen Fabric Co., recently incorporated, will equip their new plant with about 100 looms at start, for making linen towels. It is expected to have the plant in operation the middle of July. C. J. Anthony (Boston) is president of the company and M. G. Larrabee, treasurer and agent.

*New Jersey, Garfield. Operations will be started about August by the Garfield Silk Dyeing & Finishing Co., recently reported incorporated with capital stock of $25,000. Jno. B. Seyer is president and superintendent of the company, and Sam Longbottom, treasurer. A new building is under construction.

*New Jersey, Paterson. The American Silk Thread Finishing Company has begun operations. This company has capital stock of $25,000; Joseph B. Whitney is president of the company, John W. Steard, treasurer, and Xaver Bossart agent and superintendent of the plant.

*Pennsylvania, New Cumberland. The Pennsylvania Dye & Bleach Works, new company recently incorporated, will start operations in a few weeks. A building has been leased and is being equipped with machinery for dyeing and bleaching hosiery and underwear, etc., for the trade. Samuel F. Peters is president and treasurer of the company.

Enlargements and Improvements.

Massachusetts, Attleboro. R. Wolfenden & Sons are about to install a new 175 h. p. boiler, which will give them a boiler capacity of three boilers with 435 h. p. They are also installing two additional Klauder-Weldon dyeing machines. Their business has shown a marked increase of late, and within a short time they have added an 85 h. p. Corliss engine and equipped their works with automatic sprinklers, and are adding more spoolers and jack spoolers to the spooling department.

Massachusetts, North Andover. Work has been started on erection of a new mill for the Smith & Dove Manufacturing Co. The building will be 75 by 60 feet, two stories, brick, and will be used for winding, baling and shipping departments.

*New Jersey, Passaic. The Granite Linen Company, whose plant at Wortendyke was destroyed by fire recently, has leased a large building here and will start operations as soon as possible. It is thought that in time the mill will be rebuilt at Wortendyke and the plant here also continued.

Pennsylvania, Philadelphia. The mercerizing plant of Messrs. Forrest Brothers, Tacony, is pushed to its utmost capacity in dyeing and mercerizing cotton warps; they are receiving so many orders that they claim it will be necessary to materially enlarge the plant within a very short time.

Pennsylvania, Philadelphia. A permit has been granted the Philadelphia Textile Machinery Co. for the erection of an addition to their present factory of a third and fourth story which will cost $12,000.

Pennsylvania, Philadelphia. The Crompton & Knowles Loom Works (Philadelphia Branch) is

having erected a three-story storage and foundry building, 110 by 103 feet, on 17th Street, above Lehigh Avenue. The cost of the operation will be $17,000.

Pennsylvania, Philadelphia. The National Soap Manufacturing Co. now located at 2402-6-8 Montgomery Avenue, has purchased a plot at 26th Street and Susquehanna Avenue, on which they will have erected a building three stories high, 50 by 100 feet.

Pennsylvania, Philadelphia. William C. Melcher has added a dye house to his Fidelity Finishing Works at 1626 Mascher St., in which he will dye cotton, woolen and worsted fabrics in the piece as well as finish.

Rhode Island, Pawtucket. The Home Bleach & Dye Works are building an addition, 72 by 65 feet, three stories, to their plant. They expect to have same completed by July 1st.

Texas, Dallas. The Fulton Bag & Cotton Mills will shortly start operations in a branch mill which has been established here. Equipment will be installed for cutting, sewing and printing burlap bags. The cotton bags will be made at the Atlanta plant and sent here to be printed.

FIRES.

Connecticut, Norwich. About $5,000 damage was done to the stock shed of the Glen Woolen Mills by fire recently. Loss is fully covered by insurance.

Iowa, Freeport. The Union Fibre Company's flax plant at this place has been destroyed by fire. The loss is placed at $10,000.

New Hampshire, Enfield. One of the storehouses of the Baltic Mills (American Woolen Co.) has been destroyed by fire. The loss is estimated at about $40,000, partially covered by insurance.

Pennsylvania, Hawley. On Tuesday, the 20th inst., a fire caused by lightning completely destroyed H. Nollan's U. S. Knitting Mills, in which he operated 30 latch needle knitters and 15 sewing machines on wool and worsted jackets and sweaters, causing a loss of $65,000. The insurance is placed at $20,000.

Tennessee, Cleveland. The Cleveland Woolen Mills have been damaged by fire. The loss is placed at about $25,000. The carding, spinning and weaving departments are the ones destroyed, also the engine and dynamo buildings. Operations will be resumed after repairs have been made.

FACTS AND GOSSIP.

*Connecticut, Putnam. The stockholders of the Putnam Knitting Mill have petitioned for a receiver for the company.

*Georgia, Augusta. We have been advised by G. H. Nixon that he has not yet fully determined whether he will operate the Warwick Cotton Mills or not. At present necessary repairs are being made to the plant.

*Georgia, Barnesville. H. R. Robertson, representing a number of capitalists of this city, has purchased the Aldora Mills for $65,000. A stock company will be organized by the new owners and the plant overhauled. They propose installing Draper looms and manufacture cloth in addition to yarns, on which the plant has hitherto been run.

Massachusetts, Adams. William Clark, of Graham & Clark, has filed a petition in bankruptcy with assets of $45,231.53. Among the secured creditors are Schafer, Schramm & Vogel, New York, for $23,600; H. A. Caesar & Co., New York, $2,830, and First National Bank of Adams, $86.

*Massachusetts, Lowell. The foundation for the new mill of the Appleton Company is about completed.

*Massachusetts, Millbury. The John P. Crane Co., recently reported incorporated at Boston with capital stock of $20,000, is for dealing in cotton yarns and warps for the woolen trade. John P. Crane is president and treasurer of the company.

*Massachusetts, North Adams. The Johnson-Dunbar Mills have been sold at auction to Charles M. Hough, of Robinson, Biddle & Ward, representing the bondholders, for $47,000. It is stated that property was purchased for protecting their interests, and that as yet there were no prospects of the mills being started.

*Massachusetts, North Adams. A notice of a foreclosure sale of the Windsor Print Works has been issued by the State Street Trust Company, to take place September 20th.

Massachusetts, Springfield. The Oriental Rug Company has been incorporated with capital stock of $10,000 for purpose of manufacturing and dealing in rugs. F. C. Newton of Suffolk, Conn., is president of the company and Eugene E. Sykes, Springfield, treasurer.

*Massachusetts, Taunton. The Watuppa Mills, recently sold at auction, have been bought in by Col. P. H. Corr, of Taunton, for $34,000. This was for the mill proper. The receivers will shortly be discharged. It is expected that a new company will be organized and mills put in operation as soon as equipped.

New Jersey, Fairview. The Bellman Brook Bleachery Company has been incorporated with capital stock of $300,000. Benjamin J. Ward is president of the company.

New Jersey, Paterson. Foreclosure proceedings have been started against the Stark-Phillips Silk Co., which purchased the property of the Rettger-Allen Co., subject to mortgage. This company has been recently reported in financial difficulties. Mill has been idle for several months.

New Jersey, Somerville. The Somerville Woolen Mills, which assigned in April, 1904, has been taken over and is now operated by the Somerville Mfg. Co. with a capital of $25,000 and the following officers: James Brown, Jr., president and superintendent, and H. L. Wissing, treasurer. The equipment of the plant consists of 8 sets, 2,832 spindles and 50 broad looms, which they are operating on woolen and worsted men's wear, which they dye, finish and sell direct. This concern is also operating the branch mill formerly run by the old company at Pluckamin under the name of the Pluckamin Mills.

New Jersey, Trenton. The Colonial Woolen Co. reports business as good. They are operating 8 sets and 80 looms on cotton and woolen cassimeres which they dye, finish and sell direct. These mills, which have a capital of $100,000, are run under the supervision of B. Winpenny, well known

as a manager of mills running on this class of goods; he also does the buying for the establishment.

North Carolina, Hickory. The E. L. Shuford Manufacturing Co. has changed its name to the Brookford Mills, Incorporated, with address as Brookford, N. C.

Ohio, Piqua. A new building is to be erected for the Atlas Underwear Company.

Oklahoma Territory, Mangum. The project of establishing a cotton mill here is still being agitated and William Harris and John Woodward are interested in organizing the Farmers' Cotton Mill Co., with capital stock of $100,000.

Ontario, Renfrew. The Ferguslea Woolen Mills have been completely destroyed by fire and will not be rebuilt. The water power is for sale.

Pennsylvania, Glen Riddle. It is reported that Samuel R. Rhodes and John S. Butterworth are interested in starting up the Glen Riddle Mills, which have been idle for some time. These mills are equipped with about 200 looms for making cotton wadding.

Pennsylvania, Langville. The Langville Woolen Mill Co. now operates the plant formerly run by John Lang. The plant has been thoroughly remodelled and is now operated on flannels, blankets, skirting and yarns.

Pennsylvania, Philadelphia. Estimates are to be taken for a large textile plant to be erected at Allegheny Avenue, Boudinot and Hurley Streets, the plans providing for a five-story and basement main factory 55.6 by 252.10 feet, with a wing 55.6 by 42.3 feet, and one-story power house 95.5 by 22.8 feet. Both buildings will be of brick of the slow-burning mill construction plan, with brick tower fire escapes. The contractors are William Steele & Sons to whom all bids must be directed.

Pennsylvania, Philadelphia. O'Neill Bros., Inc., manufacturers of cotton and woolen waste on 16 machines at Howard & Columbia Ave., have purchased from the Oxford Mills Co. the five-story factory building at the south-east corner of Howard and Oxford Sts., the price being $22,500.

*Pennsylvania, Philadelphia. Schedules filed by the firm of Albert Herbst & Co., manufacturers of worsted yarns at Emerald and Allegheny Ave., shows the following: Liabilities aggregating $263,468.63, and assets $249,599,77. The chief item of liabilities consists of unsecured claims amounting to $210,316.

Rhode Island, Washington. A. H. Esten is now operating the Spring Lake Mill, No. 2, on woolen and merino yarns, 1 to 10 run, bobbins or spools. Plant is equipped with 8 sets cards.

Rhode Island, Washington. Thayer & McMahon are operating a plant of 8 sets cards on woolen and merino yarns. Robert McMahon, Jr., is superintendent of the mill.

*South Carolina, Walterboro. The Colleton Cotton Mills have been declared bankrupt. E. W. Hughes has been appointed referee.

Tennessee, Wilhoite. The Wilhoite Mills have beeen incorporated with capital stock of $6,000 by J. R. Wilhoite, R. C. Armstrong and others.

*Texas, Dallas. M. H. Thomas is proprietor of the Dallas Machinery Waste Mfg. Co., operating a plant here for making cotton and wool wiping and packing waste. C. H. Thomas is agent and D. Wooten superintendent of the plant. Use steam power.

Vermont, Lower Cabot. Henry Daniels has purchased Ira F. Haines' woolen mill.

It is interesting to note the general recognition and adoption of the American Moistening Company's system of humidification. This system has proved invaluable in the various lines of textile manufacture. The treasurer of a representative cotton mill writes, in sending a repeat order for humidifiers: "We will thank you to give the matter your very best attention as the hot weather is now here and we are losing much production by not having them in.

Personals.

Cotton.

James Gibson is bleacher and dyer at T. I. Birken's Lace Mfg. Co., Chester, Pa. He was formerly with the Patchogue Lace Mfg. Co.

Elias Richards, manager of the Maginnis Cotton Mills, New Orleans, La., has resigned to accept a similar position with the Lynchburg (Va.) Cotton Mill Company.

Stephen H. Garner has been appointed agent of the Hebron Mfg. Co., Dodgeville, Mass.

The following is the staff at the Gainesville Cotton Mill, Gainesville, Ga.: M. G. Stone, general superintendent; J. S. Collier, cloth room overseer and assistant superintendent; J. A. Sorrells, comber; J. C. Edwards, spinner; W. S. Smith, weaver; J. M. Stewart, chief engineer.

H. Astin, formerly of Fall River, is overseer of weaving at the Danielson Cotton Co., Danielson, Conn.

William C. Jeffers is the new overseer of carding at the Ashland Co., Jewett City, Conn. He succeeded Thomas M. Crumb.

Joseph T. Cover has accepted a position as overseer of ring spinning at the Durfee Mills, Fall River, Mass. He was formerly in the Stafford Mill, same place.

Edward J. Barry, for several years overseer of weaving at the Pemberton Mill, Lawrence, Mass., has resigned. He was presented with a silver service, ice pitcher, smoking set and ink well by the employes at the mill.

Charles E. Haynes, overseer of spinning at the Blackstone Mill, Blackstone, Mass., has resigned. He will leave shortly for New Bedford to take the position of overseer of weaving and spinning at the Whitman Mill, New Bedford, Mass.

Sydney S. Salisbury, until recently secondhand in the spinning room at the Shady Lea Mill, Rodman Mfg. Co., Allentown, R. I., has been deservedly promoted to overseer of spinning in the same mill.

Henry Doyle has acepted the position as boss carder for the Whitman Mill, New Bedford, Mass.

Abner Longdon has resigned his position as overseer in the weaving department of the Regan Mill, Rockville, Conn., and is succeeded by J. Dunn.

Albert E. Pray, who has resigned as overseer of spinning in the Whitinsville Cotton Mills, has removed to Pawtucket, R. I. John Pray, of Chicopee, has taken his place in the Whitinsville Cotton Mills.

P. E. Parks, formerly carder and spinner at the Pearl City Cotton Mill, Durham, N. C., is the new superintendent at the Arlington Cotton Mill, Gastonia, N. C.

David Gorham Arnold of Providence, son of Col. Frank S. Arnold, was married to Miss Gladys Potter, daughter of W. S. Potter, treasurer of the Flint Mills of Fall River, and the Corr Mills of Taunton.

Eugene F. Wells, who has been an overseer at the Whitman Mill, New Bedford, Mass., for the past five months, has resigned on account of poor health.

Lindsey S. Hall, second hand in the weaving room of the Clinton Mill, Woonsocket, R. I., has been promoted to overseer of that department.

George F. Payne, overseer of spinning at the Social Mill, Woonsocket, R. I., has tendered his resignation.

D. G. Marley has relinquished the position of head overseer of the finishing department of the Burlington, Vt., Enfield and Lebanon, N. H., mills on account of failing health. Mr. Marley goes to his home in Lowell, Mass., where he will spend some time in rest.

H. W. Kimball has succeeded S. J. Roberts as superintendent at the Riverside Cotton Mills, Danville, Va. Mr. Kimball was the late superintendent at the Fulton Bag & Cotton Mills.

William P. Clark, formerly superintendent of the Naushon Mill, has been appointed superintendent of the Manchester Mill and the National Pile Fabric Mill, Woonsocket, R. I.

John M. Sargent has secured the position of overseer of weaving at the Pemberton Mills, Lawrence, Mass.

Charles E. Prest has resigned as superintendent of the United States Linen Company, Millbury, Mass.

James A. McLane, superintendent of the Wampanoag Mill, Fall River, Mass., and Miss Adelaide Reynolds were married recently.

M. P. DuBose, formerly of the Palmetto Cotton Mill, Columbia, S. C., has taken the superintendency of the Valley Falls Mfg. Co., Lolo, S. C.

George Clarence Turner, formerly connected with the Argo Mills, is now superintendent of the Lincoln Manufacturing Co., of Chester, Pa. He has filled this position since the 1st of May.

John Robbins has succeeded J. M. Sargent as overseer of weaving at the Chicopee Mfg. Co., Chicopee Falls, Mass.

Paul B. Parks, formerly of the Pearl Mill, Durham, N. C., has accepted the superintendency of the Arlington Mills, Gastonia, N. C.

George F. Payne has concluded his duties as overseer of the ring spinning department at the Social Mill, Woonsocket, R. I. He has accepted a similar position at Manchaug. The help presented him with a purse of gold. Mr. Payne came here from Suncook, N. H., two years ago. John Sullivan, night overseer of ring spinning at the Nourse Mill, succeeds Mr. Payne.

Edward M. Handy, overseer of the spinning department of the mills of the Exeter Mfg. Co., Exeter, N. H., has resigned, and has been succeeded by Angus C. Burns of Manchester.

Robert H. Wilde, overseer of weaving at the Blackstone Mfg. Co., Blackstone, Mass., has resigned, to accept a similar position at the mill of the Dwight Mfg. Co., Chicopee, Mass. Belmont Mason, overseer of weaving at the Clinton Mill, Woonsocket, R. I., succeeds him.

H. H. Shumway, for the past ten years agent and treasurer of the Corr Mill, Taunton, Mass., has tendered his resignation. He will be succeeded by W. S. Potter, treasurer of the Flint Mills, in Fall River. Mr. Potter will retain, however, his position with the Fall River corporation.

W. T. Lancaster of the Occum Mill, Versailles, Conn., has accepted the position of overseer of spinning at the Ashton Mill, Ashton, R. I., made vacant by the resignation of George E. Chapman.

Samuel Lawley, overseer of the Boott Cotton Mills, was stricken with paralysis on the streets of Boston, and was taken to the hospital. Little hope is entertained of his recovery.

Prof. J. H. M. Beaty, director of the textile department of Clemson College, Clemson, S. C., has resigned to accept a position as assistant to Lewis W. Parker, president of several cotton mills in Columbia, Greenville and Greers. Prof. Beaty has been the director of the textile school at Clemson since it was started, about seven years ago. Besides being a college man, he had a thorough training in mechanics and had had several years' experience as a practical mill man as the superintendent of mills in Chester and elsewhere.

George E. Chapman, overseer of the spinning department of the Ashton Mill, Valley Falls, R. I., for the past three years, has resigned. He takes a position with the Edwards Mfg. Co., Augusta, Me.

Alonzo J. Guild, for many years overseer of the carding department of the Massachusetts Cotton Mills, Lowell, Mass., has retired. A number of his former employes, many of whom have long since left the Massachusetts Cotton Mills, gathered at his home and presented him with an easy chair and French clock. Mr. Guild began his career in these mills as a second hand in 1864, and with the exception of two years in the seventies, had been connected with the corporation to the time of his retirement.

Woolen.

Geo. P. Newell, formerly superintendent of the French River Textile Company, Mechanicsville, Conn., has been engaged by the Earnscliffe Worsted Mills to manage their new mill at Greenville, R. I.

James H. Waterhouse has retired as superintendent of the Greenville Woolen Mills, Greenville, R. I. All the employees of the mills presented him with a fine rosewood chest of silver. Mr. Waterhouse has been superintendent of the mill for about 13 years.

Walter Gledhill of Concord Junction, Mass., is

the new boss finisher for the Oakland Woolen Co., Oakland, Maine.

Henry D. Bailey, formerly superintendent of the Washington Mills, Lawrence, Mass., has been engaged as superintendent of the Stanley Company.

Thomas Blanchard, superintendent of the French & Ward mill, Stoughton, Mass., has resigned.

Fred Burkby, who has been superintendent of the coloring department of the Carolina Mills Co., Carolina, R. I., for a few years past, has resigned, to accept a position in a mill in Lowell, Mass. Ulic Burke of Vermont succeeds him.

Simon Taylor, president and superintendent of the Taylor Woolen Co., Spencer, Mass., has again taken personal charge of that mill. The mill is now running five nights a week until 9 o'clock.

Arthur William Etchells has accepted a position as superintendent for Murphy Bros.' branch woolen mill at Chester, Pa.

William Dalton, who recently engaged with the Nye & Waite Carpet Co., Auburn, N. Y., has resigned and returned to his home in Philadelphia.

William Melbourne is overseer of spinning at the Plainville Woolen Co., Central Village, Conn.

L. J. Paton, late of the Jefferson (Mass.) Woolen Co., is now overseer of weaving at the Mill No. 1 of Mann & Stevens Woolen Co., East Brookfield, Mass.

John Powers has taken a pisition in the weave room at the Taconic Mill, Pittsfield, Mass.

Thomas Smith, who recently resigned as boss weaver in the mill of the Reliance Worsted Company, Norwich, Conn., to accept a similar position in Mechanicsville, was presented with a gold ring and a clock by his former employees.

John O'Neil, who has been for the past ten years second hand in the weave room at the Eagle Lake Woolen Co., Jefferson, Mass., has recently been promoted to overseer of weaving.

William Quirk, second hand in the weave room at Mohegan, R. I., was married to Miss Alma Jones Thursday, June 8.

John Campbell will be boss weaver for the Stanley Woolen Co., Woonsocket, R. I., succeeding James Preston.

Harry White has resigned as assistant superintendent of the Sutton Woolen Mill, North Andover, Mass. He has been connected with the mill for thirteen years. He was presented by the overseers and a number of the employes with a gold plated French clock.

Maurice G. Einstein, designer at the Saranac Mill, will sever his connection July 1st, and will go to a mill in Philadelphia.

C. Truslowe, second hand of finishing at the Hanover Woolen Mfg. Co., Hanover, Ill., has been promoted to boss finisher.

John Bond, who has for some years been boss spinner at the mills of the Waterloo Woolen Mfg. Co., Rochester, N. Y., has resigned, and his son, Levi Bond, of Auburn, has taken his place.

John W. Baxter, superintendent of the spinning department of the Atlantic Mills, Providence, R. I., has resigned.

C. E. Donovan is boss weaver at the Squam Lake Woolen Co., Ashland, N. H.

David Welsh has resigned his position with the Scotia Worsted Mills, Woonsocket, R. I., as overseer of finishing, to accept a position with the Geo. H. Gilbert Mfg. Co., Ware, Mass.

Charles A. Kendall has been appointed superintendent of the shoddy mill of the Mohawk Mfg. Co., Oswego, N. Y.

Frank W. Scribner, formerly designer at the Calumet Mill, and now superintendent of a mill at Swanzey, N. H., is to return to Uxbridge, Mass., July 1 to accept a position as assistant superintendent in the Elmdale Mills, operated by Samuel F. Scott.

Benjamin N. Chanalis, a graduate in the regular three years' day course of the Philadelphia Textile School, has accepted a position as designer with the Moosup (Conn.) Woolen Mills of the American Woolen Co.

Robert P. Hall has resigned his position as overseer of weaving at the Squam Lake Mills, Ashland, N. H.

John McCauley has succeeded Frank Judson as finisher at the Forestdale Mills, Stafford Springs, Conn. The latter has accepted a position at the Glenville Mills, Glenville, Conn.

E. A. Klingensmith, Peru, Ind., has secured the position of loom boss and designer at woolen mill in Sedalia, Mo.

H. G. Horwill has resigned as foreman of the F. W. Agan shoddy mill, Ludlow, Vt.

Patrick Mulligan has been engaged as boss spinner in the Stanley Woolen Co.'s mill, Uxbridge, Mass., and Michael Tracy, boss dresser.

James C. Bothwell has accepted the position as boss carder at the Worcester Woolen Co., Worcester, Mass.

John Burns, overseer of weaving at the Nasonville (R. I.) Mill, has resigned and accepted his old position as overseer of weaving at the American Woolen Co.'s mill at Moosup, Conn.

George D. Keddie is the new designer at the Pawcatuck Woolen Mills, Potter Hill, R. I.

Sam Driver, the well-known veteran wool carder, is setting up cards for the Davis & Furber Machine Co., North Vassalboro, Me.

Gus F. Horman has accepted the position of boss carder for Joseph Noone's Sons Co., Peterboro, N. H., succeeding E. A. Morrow, resigned.

John Mulligan has resigned as boss weaver for A. Roberts & Co., Claremont, N. H.

Daniel Cowell has taken a position at Tillotson Mill, Pittsfield, Mass.

Frank Carr of Grand Fork, North Dakota, has taken a position at the Hanover Woolen Mfg. Co., Hanover, Ill., as mule fixer.

Willard A. Currier of Newburyport, Mass., has been made assistant treasurer of the American Woolen Co. at its Boston office.

Carl Taubert has accepted the position as designer at the Manton Mills of the American Woolen Co., Providence, R. I.

Harry S. Yorke, for several years in the designing department of the National & Providence Woolen Mill, Olneyville, R. I., recently accepted a position with the Belleville Woolen Mill, at Allentown, R. I.

Robert E. Fritchie, formerly overseer of weaving

at the American Felt Co., Glenville, Conn., is now at the Verd Mont Mills, Ludlow, Vt.

Benjamin Degnam is the new foreman of the finishing department at the Morrison Woolen Co., Dexter, Me.

Philip Bond, for 54 years in the employ of the Hamilton Woolen Co., Southbridge, Mass., and of late superintendent of the new mill, was happily surprised on the occurrence of his 70th birthday by being presented with two handsome rockers by his employers, the presentation being made by Roland E. Akers.

C. Trustlow, second hand in finishing department of the Hanover (Ill.) Woolen Mfg. Co., has been promoted to overseer of that department.

Willard D. Cragin, overseer of carding at the Stanley Mill, Uxbridge, Mass., has resigned.

Miscellaneous.

William Blickley, who has been employed in the pattern room of the Draper Co., Hopedale, Mass., has begun his duties as foreman of the tool room of the bobbin shop. The bobbin shop is a new department of the company. Robert Goodnow is foreman. About twenty men are employed there.

Henry McCusker has been elected by the directors of the Lewiston Bleachery and Dye Works, Lewiston, Me., agent, to succeed the late James A. Walsh. Mr. McCusker has been acting in that capacity since the death of Mr. Walsh, and his appointment as agent has been expected.

John Edmund has accepted a position in Rice's Silk Mill, Pittsfield, Mass.

I. J. Smith, formerly representative for New York State for the Berlin Aniline Works, has entered the employ of Messrs. Kalle & Co., as their representative in the same territory, succeeding E. J. Feeley, who takes charge of Messrs. Kalle & Co.'s Boston office.

Frank E. Burbank, for eight years general manager of the Greenwich Bleachery, East Greenwich, R. I., has severed his connection with the concern to take a similar position with the Barrowsville, Mass., Bleachery, a new company. Harry M. Pierce, formerly identified with the Saylesville Bleachery, succeeds Mr. Burbank at the Greenwich Bleachery.

John W. Arrington, formerly general manager of the Union Bleaching & Finishing Company, Greenville, S. C., at a meeting of the Board of Directors held recently, was elected president and treasurer. The bleachery has been in operation about two years. Mr. Arrington took charge of the plant less than twelve months ago, coming from Richmond, Va. Assisting him in the direction of affairs at the plant is Henri Schaeffer, the superintendent.

Mr. W. E. Farrell, for many years manager of the Birdsboro Steel Foundry & Machine Co., announces his having severed his connection with that company to accept the vice presidency of M. H. Treadwell & Co., of Myrestown and Lebanon, Pa. Mr. Farrell will be located at Lebanon, having entire charge of the plant at that place.

Deaths.

James C. C. Davol, for many years prominently identified with the local mill industry in Fall River, Mass., died at his home in that city recently. He was born in Fall River about 50 years ago. His father, Stephen Davol, was one of the pioneers in mill circles in Fall River, having been the builder of the Pocasset Mills, of which James C. C. Davol later became the superintendent, where he was for many years, and also for some years was superintendent of the Mechanics Mills.

Thomas Hinchliffe died in Racine, Wis., on June 11th. He was formerly employed in the Merrimack Woolen Mills, Dracut, Mass., and the Aetna Woolen Mills, Watertown, Mass. At the time of his death he was superintendent of the Racine (Wis.) Woolen Mills, where he had been employed for the past eight years.

J. E. Pugh, secretary of the Commonwealth Cotton Mills at Durham, N. C., died in Littleton, Colorado, where he went a few weeks ago to recuperate his health.

Robert Wilson, a retired textile manufacturer of Chester, Pa., died recently, aged 80 years. Until a few years ago he was identified with the South Chester Mfg. Co.

M. H. Vaughn, aged 56 years, died June 16th in West Huntsville of tuberculosis of the lungs. He was for a long time a foreman employed in the Dallas Mills. His widow and seven children survive him.

John Atkinson Gilmore, chief wool inspector for the Schuylkill Arsenal, Philadelphia, Pa., died in Webster, Mass., May 31st. His death was caused by heart disease. He went to Webster about two months ago to inspect the product of woolen mills, the output of which had been bought by the government. The deceased was 65 years old and a native of Ireland. For more than 20 years he was connected with the mills of Campbell & Elliott in Philadelphia, finally reaching the position of superintendent.

Thomas Mack, superintendent of the Hillsborough Woolen Mill Co., Hillsboro Bridge, N. H., died recently of apoplexy, aged 61 years. He is survived by a wife and one daughter in Holyoke, Mass., and a son, Dr. John A. Mack of Crompton, R. I.

Hugh Monie, well known throughout the cotton trade as the author of several technical books on cotton, cotton sizing, etc., and principal of the Victoria Jubilee Technical Institute, Byculla, India, died recently. Mr. Monie went to India in 1888 to take the position as head of the textile department of this Institute and was considered an authority on textile manufacturing.

Arthur C. Stott of Hudson, N. H., died June 9th. Mr. Stott was the son of the late Commodore Frank H. Stott of Stottsville, and, with his brothers, composed the firm of the Stott Woolen Company. Previous to the death of former Mayor Strong and Commodore Stott the firm was reorganized and Arthur C. Stott retired.

Andrew Howarth of Worcester, Mass., died recently. He was one of the pioneer woolen manufacturers of the United States. Aged 84 years. Mr. Howarth began the manufacture of woolen goods at Northfield, Vt., in 1872.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The Annual Official Textile Directory for 1905. Lord & Nagle Co., 299 Devonshire St., Boston.

The Textile World Record has compiled and published the 1905 edition of this well-known book, which is now ready for delivery. It contains 532 pages and 22 textile maps. A very thorough personal and mail canvass of the trade has been made and the publishers believe that it will be found more accurate and complete in detail than ever before.

Full reports are given of all the textile establishments in the United States and the Dominion of Canada.

The same system of arrangement is preserved, which is found so useful by mill men and travelers. All the mills in any town or city are listed under the town, which avoids the necessity of turning from page to page to be sure that all the mills have been located. If, however, a person is only interested in a certain line of mills, the system of classification enables quick and easy reference to either cotton, woolen or knitting mills without looking at the detailed report.

There is also an index where all mills are arranged alphabetically, according to names, with page number on which the report may be found.

The yarn trade index, which has proved most useful, has been materially expanded, as has also the classified list of commission and order mills and dyeing, bleaching and finishing establishments. There are lists of shoddy and extract manufacturers, wholesale rag dealers, cotton dealers and wool dealers and brokers, manufacturers' selling agents and dry goods commission merchants.

This year we were in some doubt as to whether to include a list of manufacturing clothiers and suit aand cloak makers on account of the growing size of the book, but on making a canvass we learn that this feature is considered one of importance by a large proportion of the users of the directory, especially the manufacturers, so it has been carefully revised and materially added to.

The names of 624 new textile establishments are included in this edition which did not appear last year, while the names of 759 have been taken out. Users of the Directory will appreciate the importance of taking out dead names even more than the inclusion of new ones, for if there is anything that exasperates a traveling man it is to spend time and money in visiting some mill listed in a directory and find that it is out of business. In this particular this edition excels any other work, and the importance of having the new book is shown by the great number of changes. The price of Traveller's Edition is $2.00; Office Edition $2.50. A special combination price is made in connection with the Textile World Record of $3.00 or $3.50 per year, according to the edition of Directory desired. A descriptive circular will be sent on application.

The new edition of Moody's Manual of Railroads and Corporation Securities is received and contains a very marked increase in the amount of information, averaging over 50 per cent. in comprehensiveness. This year's edition comprises 2,500 pages, 7x9 inches; the book is four inches thick. There are ten sections, each compiled by an expert.

This Manual combines in itself a complete reference book of steam railroads, electric traction roads, gas and electric light companies, water supply companies, telegraph and telephone companies, industrial corporations, mines and oil corporations, banking and financial institutions. It also contains a list of the members of the twenty-five stock exchanges in the cities of the United States.

This book now circulates all over the world and in no other publication can a similar aggregation of knowledge of the great corporations and industries of the United States be obtained. It gives information about the capitalization, earnings, officers, etc. The volume is published in two bindings: Full Russia leather at $12 per copy; red cloth at $10. It is published by the Moody Corporation, 35 Nassau St., New York City.

Foreign Markets for American Cotton Manufacturers; Department of Commerce and Labor, Washington, D. C.

The Bureau of Statistics of the Department of Commerce and Labor has issued a valuable pamphlet which contains the reports of consular agents of the United States who were instructed to make the necessary investigations and report on the possible markets for American cotton goods in their respective districts. In order that the inquiry might have definite value fourteen questions were asked. These questions were prepared by the New England Cotton Manufacturers' Association at whose request the action was taken. The interest of the report is enhanced by comparisons between 1880 and 1893. The figures for 1880 were taken from a consular report No. 12, 1881, designated "The Cotton Goods Trade of the World, and the Share of the United States Therein," compiled from reports sent by the consuls at the time Mr. Blaine was Secretary of State. The compilation of this report is most timely in view of the greater interest that is now being taken in the export trade by American cotton mannufacturers and merchants. A copy of this pamphlet should be in the hands of all such, as it contains a great deal of practical information, including the names of firms in the different countries that might handle American cottons.

Business Literature.

A Heart-to-Heart Talk to Cotton Manufacturers.

Under this striking title L. T. Houghton of Worcester, Mass., has issued an attractive booklet. It presents interesting data which is much more effective than the manufacturer's "say-so." A striking point brought out is the result of tests conducted at the Whitinsville cotton mill last February, which were undertaken in order to demonstrate impartially the comparative effects produced by accurate and inaccurate adjustment of thread guides. These tests showed that the breakage on frames where the spindles were slightly out of adjustment —in no case more than one-sixteenth of an inch in

or out (and with the ordinary wooden thread board finer adjustment than this is impossible)—was about three and one-third times as much where the guides were set inaccurately as on spindles having perfectly adjusted guides. Already upward of a million and a half spindles are equipped with the Houghton thread boards and this has been accomplished in a little over three years. All the mills using them have noticed an increase in production and in two instances this increase has amounted to 5 per cent. of the total production. Every cotton spinner will find this pamphlet well worth reading.

New Book on Shears.

Parks & Woolson Machine Co., of Springfield, Vt., has issued what it calls "A Shear Book," which gives all sorts of information and pointers about shears and their care, and much useful information about blade grinding. The book will be sent free to manufacturers and finishers on request.

Steel Frame Canvas Baskets.

W. T. Lane & Bro., Poughkeepsie, N. Y., have recently issued catalogue and price list No. 24, quoting prices on their line of canvas mill baskets adapted to textile purposes. The Lane canvas mill sheet is one of their specialties, as well as the light weight doffer basket.

Advertising for Profit.

The Manufacturers' Advertising Bureau, New York City, have recently issued the fifth edition of this little booklet, which will be of much interest to trade papers covering a general line of advertising. The Manufacturers' Advertising Bureau has been in business over a quarter of a century, and in that time has gained a great deal of valuable knowledge about advertising, which is of the utmost value to its clients, using a large list of papers covering many lines of industry.

Boomer & Boschert Press Co., Syracuse, N. Y.

This firm have issued a comprehensive catalogue giving a general idea of the styles and prices of their presses, including knuckle joint, power screw and hydraulic presses for special purposes. Their baling and yarn presses are in extensive use among textile manufacturers.

Water Softening and Purifying.

The W. B. Scaife & Sons Company, Pittsburgh, Pa., have issued an attractive booklet showing views of different installations of the We-Fu-Go water softening and purifying systems, among which are several textile establishments. For the latter concerns there has not only been a saving by getting pure water for the boiler plant, but in washing, bleaching and dyeing. This booklet will be sent upon application.

Water Wheel Governors; Replogle Governor Works, Akron, O.

An illustrated catalogue describing in detail the various types of mechanical water wheel governors suitable for all conditions.

Westinghouse Exhibit at the Lewis and Clark Exposition.

The Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa., have issued a beautiful booklet in keeping with all their business literature, descriptive of the different exhibits of the Westinghouse Electric and Manufacturing Co. at the Portland Exposition. Their exhibits have always been important features of the great expositions for many years and a study of them will enable the visitor to keep in touch with the developments and progress of electrical science in its application to industrial purposes.

Gould's Manufacturing Co., Seneca Falls, N. Y.

A booklet describing the new Duplex bronze warper lifter and hydraulic engines operated by city water pressure.

Changes in Cotton Machinery Concerns.

At the annual meeting of the Lowell Machine Shop, held in June, Haven C. Perham, who has been for many years treasurer of the Kitson Machine Co., was elected to a similar position in the Lowell Machine Shop. Robert F. Herrick was chosen president. The Kitson Machine Shop has been organized under Massachusetts laws and taken over the plant and business of the Kitson Machine Company, with the same officers as the Lowell Machine Shop, Mr, Perham being treasurer of both concerns.

The Kitson Company have purchased the controlling interest of the A. T. Atherton Machine Company, of Pawtucket, and the business of that company will be merged with that of the Kitson works at Lowell Mass. That, however, is the only merger that is to take place, the various other rumors of the consolidation among textile machinery builders having been without foundation.

Large Westinghouse Sales in Japan.

The rapid advance of civilization in Japan has been closely followed by increased industrial activity. In no other way is this fact shown more forcibly than by the large orders for improved types of machinery which are being continually received by well known American manufacturers. The numerous orders received by the Westinghouse Machine Company, of East Pittsburg, Pa., for steam and gas engines, not only speak well for the products of that company, but also show that the Japs are as thoroughly informed along industrial lines as they have shown themselves to be in the science of war. During the years 1903 and 1904 Takata & Company, Agents for the Westinghouse Machine Company in Japan, have sold no less than 56 Westinghouse engines, ranging from 600 H. P. down to 12-1/2 H. P. and aggregating in capacity almost 8,000 H. P. They are all of the vertical single-acting type, both simple and compound. The list of customers comprises goverment arsenals, railroads, electric light companies, bureaus, water works, mines, universities and hospitals.

The Brown Engineering Co., Reading, Pa., are in charge of the design and erection of the power plant and system of electric drives for the new plant of the Textile Machine Works of Wyomising, Pa. A new three-story concrete steel building, 200 x 50, is being completed, and will be used for textile work, principally braiding and knitting machines, which will be equipped with individual motors and lighted by arc lamps equipped with concentric diffusers. There will be in all approximately thirty motor drives.

The Birdsboro Steel Foundry & Machine Co., of Birdsboro, Pa., announce that they have opened an office at 718 Real Estate Building, Broad & Chestnut Streets, Philadelphia, in charge of J. P. Warfel. Mr. Warfel has represented the company in this section for some time, and has met with much success. Any inquiries addressed to the Philadelphia house will receive the same prompt attention as though directed to the home office at Birdsboro.

Vacation Resorts in New England.

The vacation season has commenced, and he who makes his arrangements in time is in no danger of getting left. Seashore and inland resorts have made great preparations for this year, and the Boston & Maine Passenger Department is always ready to act as adviser and conductor. They have issued thirteen beautiful descriptive books describing in detail every portion of Northern New England and entitled:

"All Along Shore," "Lakes and Streams," "Among the Mountains," "Central Massachusetts," "Valley of the Connecticut and Northern Vermont," "Monadnock Region," "Southeast New Hampshire," "Southwest New Hampshire," "Lake Sunapee," "Fishing and Hunting," "Lake Memphremagog," "Hoosac Country and Deerfield Valley," "Merrimack Valley."

Any one of the above descriptive books will be mailed upon receipt of two cents in stamps for each book. They have two beautiful colored maps, one a bird's eye view of the White Mountains from the summit of Mt. Washington, showing each ravine, mountain peak and valley as seen from the summit and a key at the bottom telling the number and name of each place, the other is a bird's eye view in colors of the beautiful Lake Winnipesaukee. Six cents in stamps will procure either map. Besides the maps they have six beautiful portfolios, beautiful reproductions of choice scenes in New England; each picture 4 by 6 and 210 pictures in the set. The set contains:

"Rivers of New England," "Mountains of New England," "Lakes of New England," "Seashore of New England," "Picturesque New England," "Charles River to the Hudson."

The entire set will be mailed upon receipt of thirty-six cents in stamps or six cents will procure any one book.

Look over the above list and tell them what you want. They will send everything upon receipt of seventy-four cents. In about three weeks their Hotel and Resort Book for 1905 will be ready. General Passenger Department, Boston & Maine Railroad, Boston, Mass., is the address.

A Remedy for Scarcity of Help.

The June number of Cotton Chats, published by the Draper Compiny, is of especial interest because of the interesting and at the same time logical suggestions which they make as a remedy for labor scarcity. They argue that a change from the common loom to the Nortthrop would promptly remedy the scarcity. There are thousands of power looms which might be exchanged for Northrop looms, and the extra help liberated would naturally be absorbed in other departments. They state what is borne out by our Mill News pages, that there is much less tendency toward the erection of new mills than in previous years, while the present mills are more favorably disposed toward the improvement of their equipment and getting in line to reduce the cost to meet competition.

They call attention to the fact that there are Southern mills using Northrop looms on print cloths where the weavers are paid 5 1/2 cents per cut for 52 yards, with no extra help to fill bobbins. Some of these mills run 66 hours per week and get 100 per cent. production for the looms by running them unattended through the noon hour. They state the case of one sheeting mill where 1,300 Northrop looms have never had more than 56 weavers, sometimes less. We know of one Connecticut mill where the manufacturer gets even more than 100 per cent. production by letting the looms run at noon-time and at night. The magazines are filled up when the help go out, the looms left running until they stop, and as the watchman goes through he shuts off the power.

It is a matter of first importance for manufacturers of all kinds, and particularly manufacturers of knit goods, that they should market their products through jobbing houses which reach every department of the retail trade. It is really a vital mistake for a manufacturer who does not sell his own goods to put them into the hands of middlemen who have only limited opportunities of reaching the retail distributors. One of the most enterprising of the reliable jobbing houses in this part of the country is that of Ellis Brothers at 533 Market Street, Philadelphia. This concern has recently been compelled, by the rapid expansion of their business, to move into new quarters. It is now occupying the entire building at the number given above and is carrying one of the largest stocks of hosiery and knit goods upon the Atlantic seaboard. They started business in a small way a few years ago, but within the past ten years have been compelled to move three times in order to obtain larger quarters in which to conduct their swiftly growing business. The Messrs. Ellis are placing orders for the spring of 1906 and manufacturers who are looking ahead will consult their own interests if they will examine the facilities and advantages offered by this firm. They have an outlet for all classes of merchandise from the cheapest to the highest grades of knit fabrics. The firm is now in a position to handle goods in any quantity so that the largest mills, as well as the smallest should find with them a channel of obtaining quick and profitable distribution.

A Western Dye Works for Western Mills.

Western mills which have been in the habit of sending their goods East for dyeing will be pleased to learn that a large dyehouse in Chicago is now prepared to fill their orders. The Western Textile Fibre Company recently enlarged their plant, putting in additional machinery and engaging some of the best expert dyers in the country. Heretofore they have done dye work only under contract for very large quantities, but they are now prepared to handle smaller orders.

By sending their goods to this dyehouse, the Western mills and also those in some territories of the South, can not only save expense, but will be freed from the possibility of waiting some days for shipments to be returned. The Chicago concern claims that it will fill any order on 24 to 48 hours' notice. They are prepared to handle any sized orders from comparatively small ones to the largest. For outside work they have a capacity of 20,000 lbs. a day, the house being equipped with Klauder-Weldon dyeing machines and automatic dryers. There is a switch track for handling carload lots which runs into the building.

The company makes a specialty of dyeing fast black and colors on cotton yarns, mercerized cotton and knit goods. Details may be learned by addressing the Western Textile Fibre Company, at Root and La Salle Sts., Chicago.

Lake Memphremagog.

THE "LOCH LOMOND" OF AMERICA.

Lake Memphremagog, in Nothern Vermont and Canada, is one of the most charming resorts in the Green Mountain State. This lake is thirty miles long and two and a quarter miles wide, and over two-thirds of its length is in Canada. In early days a favorite haunt of the Indians for fishing and camping; it was named by them Memphremagog, meaning "beautiful water." The Steamer "Lady of the Lake" leaves Newport sailing the entire length of the lake to Magog, occupying about four hours. The view as witnessed from the decks of the steamer is magnificent; the charms of the rocky and uneven shore; the towering cliffs, the long stretches of green forest land and the distant peaks of Owl's Head and Orford Mount, with intervening sweeps of beautiful valley land, present a panorama which appears more beautiful at every turn.

The "'Switzerland of America" this region has been called, and many people see in Memphremagog another Loch Lomond, while the Canadian portion has frequently been termed the "Geneva of Canada." In order to get a comprehensive idea of the marvelous scenic surprises of this region, send two cents in stamps to the General Passenger Department, Boston & Maine Railroad, Boston, for their beautiful illustrated booklet, entitled "Lake Memphremagog and About There," and two cents for a companion booklet, entitled "Valley of Connecticut and Northern Vermont."

A Very Busy Firm.

Messrs. Speed & Stephenson, 170 Summer St., Boston, Mass., are unusually busy at this time. They are now equipping the Limerick mills of Limerick, Me., with a complete outfit of worsted machinery on the Bradford system, and are very busy on other orders throughout the state. Their machinery business has expanded a great deal in the past year and they have on their list for immediate delivery a large line of worsted and other textile machinery and keep well informed of everything there is in the market and quote prices on any machines needed for manufacturers' requirements. In their advertisement on another page is a long list of worsted machinery and offerings from two important plants.

Automobile Trucks for Mill Service.

That the sphere of automobiles is broadening and that far-seeing concerns have prepared for their general use as business vehicles is shown in the fact that one of the leading builders of motor cars, The Packard Motor Car Co., Detroit, Mich., is using trade journals to advertise its line of business. The Textile World Record does not accept advertising which does not pertain to its field, but it recognizes that the use of automobile trucks is a subject that is properly of interest to manufacturers and that there are many mills so situated that they can be used to advantage.

As the builders of the Packard car state in their announcement, their motor truck is not a pleasure vehicle "warmed over" for its purpose. It is designed from the ground up solely for trucking service. It has been given most severe tests in two years' actual service by manufacturers and merchants in all lines of business, and has been clearly demonstrated to be a money saving vehicle.

Large corporations who have occasion to transport material from one part of the yard to another and mills that are located some distance from the railroad will do well to investigate this question, and see if there are any advantages over the present methods of transportation. It has been found to be so in other lines, and there seems to be no reason why it should not be so in the textile business.

In the interesting advertisement to be found on another page, illustrations of two types of trucks are shown. Various other styles are built to suit varying requirements.

The Dwight Mfg. Co., of Chicopee, Mass., have placed with the Saco and Pettee Machine Shops a repeat order for revolving flat cards and they are now being installed.

Prosperous Pawtucket.

Pawtucket is enjoying a business boom and important additions are being made to some of its largest industries, among them the Lorraine Mfg. Co., the Royal Weaving Co., the Phillips Insulated Wire Co., and the Home Bleach and Dye Works. The E. Jenckes Co. are building a new mill as are also the Smith Webbing Co.

More Facilities and Improvements for the Patrons of the New Jersey Central.

To lead, not to follow, is the motto which the New Jersey Central has before it at all times and a demonstration of that fact is the establishment of the new uptown ferry of the Jersey Central at West 23d Street. The mammoth building which is to be used as a ferry house is of steel construction, advantageously located in the very heart of the hotel, shopping and theatre district. There is at this new station every convenience which the traveling public might anticipate, such as lounging rooms for ladies and gentlemen, telegraph, public telephones, news stands, flower booths and the hundred and one little necessities which make traveling a delight rather than a burdensome task.

The commuter, and the New Jersey Central's commuters are numbered by the thousand, can purchase his monthly tickets at 23d Street as well as at Liberty Street, or his home station. Parlor car tickets can be bought and as usual a complete baggage checking system has been installed. The ferry between 23d Street and the New Jersey Central's Jersey City Station is a delightful sail and two new boats, the Elizabeth and Wilkesbarre, will be in operation.

Both are twin screw and double-decked boats making the trip in very short order and connecting with not only the through trains but the commutation or suburban trains as well. The New Jersey Central has just placed an order with the Harlan & Hollingsworth Company, of Wilmington, for two more fast boats for the 23d street ferry. This will make a fleet of ten new double-decked ferry boats operated by this company. That the New Jersey Central is a road whose interests are its patrons was some time since recognized by the public.

One of the most widely known features was the placing in service of twenty-four new trains for its New York and Philadelphia service in a single day and the farsightedness of the move has been acknowledged since every one of these trains is a paying venture, and from time to time new trains have been added until now there are trains every hour and on the hour from 7 a.m. to 9 p. m. between the metropolis and the Quaker City.

Again recognizing a public demand the New Jersey Central has just built and placed in commission six new dining cars introducing several features new to the traveling public, first of which is the arrangement by which the traveler in the day coach has access to the dining car. The custom on all roads heretofore being to limit the dining car to the parlor and sleeping car passengers only. The service for breakfast and lunch is a la carte, while the dinner is served table d'hote at the rate of $1.00 per capita.

The New Jersey Central has just placed in commission something like thirty new coaches of the most approved style of architecture and though its four-tracked road-bed is a recognized model of standard road making, nearly two thousand cubic yards of crushed stone will be used for construction during the present season and no less than three thousand tons of 90-pound steel rail will also be used. Only recently the New Jersey Central opened a new uptown landing at West 42d Street for its famous boats, the Asbury Park, Monmouth and Sandy Hook of the Sandy Hook Route, making it possible for seashore patrons from the residential section of New York to reach the New Jersey Coast resorts in a most comfortable and convenient manner while the landing downtown is at the new pier at the foot of Cedar Street.

Better Provision for Southern Customers.

A desire to give prompt service and quick deliveries to Southern mills has led the Draper Company to establish a supply depot at Atlanta, so that their Southern customers may receive more prompt attention and quicker delivery of parts and supplies. The manufacturers of the new Barber warp tying machine have, we understand, decided to locate a plant at Greenville, S. C., and quite recently an old Philadelphia textile machine shop was acquired by an enterprising North Carolina concern which is extending its textile machinery facilities. Most of the important machinery builders and supply houses now have Southern agents or branches and the mill trade in this section is as thoroughly covered as in the North.

The Hopkins Machine Works, Bridgton, R. I., have been filling numerous orders for their piece dyeing machines the last few weeks. Among the machines recently shipped were an 8-string piece dyeing machine to the Nasonville Woolen Co., Nasonville, R. I., the Medway Woolen Co., Medway, Mass., and the Scotia Worsted Mills, Woonsocket, Mass.; a 9-string piece dyeing machine to the Enterprise Dye Works, Woonsocket, R. I.; a 6-string machine to the Namquit Worsted Mills, Bristol, R. I., who have also bought a 6-string cloth washer; a 4-string dyeing machine to Sidney Blumenthal Co., Shelton, Conn. The Samuel Fitch Mfg. Co., Thornton, R. I., have recently installed one of their 8-string cloth washers. To the Peacedale Mfg. Co., Peacedale, R. I., they are supplying a waste duster and have made a number of installations of dye tubs, tanks, vats, etc., in numerous Massachusetts and Rhode Island mills.

Textile Exposition at Turcoing.

In our May issue we gave notice of the forthcoming exposition at Tourcoing, France, from May to September, 1906. It promises to be an important affair and machinery exhibits from England and the Continent as well as manufactured textile products will probably be shown. The address of the Director-General of the exposition is E. O. Lami, Hotel de Ville, Tourcoing, France.

The problem of success is largely a problem of equipment. McLeod & Henry Co., Troy, N. Y., manufacture boiler door arches, fire box blocks and a patent back combustion chamber arch of their celebrated "Steel Mixture" material, which for durability have no equal.

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YALE & TOWNE EXHIBIT OF LOCKS, BUILDERS' HARDWARE AND DOOR CHECKS AT THE RAILWAY APPLIANCE EXHIBIT, WASHINGTON, D. C.

Sizing Troubles.

If you find any difficulty with sizing and finishing, or if you have a desirable improvement in view, the Arabol Mfg. Co., 100 William Street, New York, are good people to help you. Scientific specialization, long and extended experience, modern facilities in factory and laboratory, enable them to advise for diverse conditions. They are continually adding to the staples that have made them so popular with the trade.

Engineers who have tested Albany Grease willingly admit its effectiveness on either slow or fast running machinery, and claim it is the ideal lubricant in either warm or cold weather. The manufacturers, Adam Cook's Sons, 313 West St., New York City, are constantly reminded of this in letters which reach them from various points.

In a recent communication from T. J. Hall, proprietor of the Point Pleasant Mills, Eminence, Ky., the writer states: "I did not know what a cool bearing was until I used Albany Grease."

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"Please forward us at once eight compression cups to be same as sample cup which you sent us last month. The grease and cup are giving us entire satisfaction and we wish to put in the above in the place of oil cups which we are at present using."

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The New York Public Library is making a collection of current trade catalogues and similar publications and extends an invitation to the trade to send the library any catalogues they may have for distribution. The New York collection now numbers over 30,000 pieces and is being catalogued and shelved according to the names of the firms represented as well as the articles listed. It is desired to include a copy of every catalogue issued and copies of any trade literature that may be issued in future. The value of such a collection both to the library and to the manufacturers represented in it is self evident and will increase with the increase in the number of individual manufacturers. The catalogue should be addressed to the New York Public Library, New York City.

The Largest Textile Machine Works in the World.

The name of Platt Bros. & Co., of Oldham, England, is known wherever textile fabrics are manufactured. Some idea of the magnitude of their works may be had from the statement that they employ about 12,000 work people. We have some large textile machine works in this country, but we believe the largest seldom employs more than 3,000 workmen. The Platt works are divided into several branches, each of which is in itself a large establishment. Besides the machine shops there are a foundry, saw mills, spindle works and other accessory departments. The machine shop alone covers an area of 56 acres. Like all the English machine works at the present time, they are very busy having, we understand, orders on hand for equipment aggregating 1,500,000 spindles. They build practically everything in the line of textile machinery, not only for cotton, but also for woolen, worsted, silk and every kind of mill accessories. Evan Arthur Leigh, Esq., 232 Summer St., Boston, Mass., has represented Platt Bros. & Co. in America for many years.

Good Combed Work in the South.

A Northern mill man who has been visiting some of the Southern yarn mills writes of a combed yarn mill in one of the Carolinas as follows:

"This mill is making combed and carded yarn up to 80s. I think it is one of the best mills in the South. From a Northern standpoint they are a little slack in a good many things that are not kept up as they are in the North, but that is a matter that can be easily remedied. All the production of this mill goes to Massachusetts. It is a little warm here, ranging from 92 to 97, but it is all right in the shade and there is almost always a good breeze.

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A local correspondent thus describes its work: "Linen waste is fed into the machine, goes through carding system and is then spun on a cotton yarn, which is the core of the finished yarn. In this way, waste material, having very little length of fibre, is spun into a strong thread. Not only linen waste, but fur and hair it is claimed, may be spun around this cotton core. About one pound of cotton yarn to three of waste material is used in the production of finished yarn."

It is stated that Mr. Cannon has purchased the United States rights for the manufacture of linen goods by this process.

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The workmen employed in the washroom of a large mill in Lawrence get their clothing quite wet during the day and some of them have been in the habit of throwing their wet garments over the steam pipes which run through the center of the room. This pipe is covered with magnesia, but the flanges are exposed and a pair of old trousers coming in contact with the iron started a smouldering fire. Fortunately the watchman smelled the smoke, located the source and put it out with a pail of water. As the pipe was quite near the floor above serious damage might have been caused had the clothes burst into flame.

The Standard Extract Co., importers and manufacturers of extracts of all kinds, have moved to larger and more commodious quarters at Saugus, Mass., where they have a working capacity of 150 barrels per day.

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New England Seacoast.

BEAUTIFUL BEYOND DESCRIPTION.

New England's seacoast, the ideal recreation ground during the summer, is preparing to welcome her visitors. In a short while the beautiful North Shore of Massachusetts, including Manchester-by-the-Sea, Marblehead, Clifton, Rockport, Devereux, Gloucester, etc., will be festive resorts, assembling together the foreign ambassadors and Washington diplomats who especially favor this section. Hampton and Rye beaches in New Hampshire, delightful pleasure resorts, in a few weeks will harbor thousands of amusement seekers; York, Kittery and Kennebunk are ready for the cottagers. Old Orchard will appear more smiling than ever this year. Portland, fronting on the handsome Casco Bay and the delightful islands have donned their summer apparel. North of Portland the shore resorts to Bar Harbor and beyond in New Brunswick are ready for the summer influx. You can scarcely appreciate the beauties of the sea coast without a visit; but there are two publications which will do much to enlighten you. A beautiful portfolio containing twenty-eight half-tone reproductions of seashore views will be mailed by the General Passenger Department, Boston & Maine Railroad, Boston, upon receipt of six cents, and a descriptive booklet entitled, "All Along Shore," will be mailed upon receipt of two cents in stamps.

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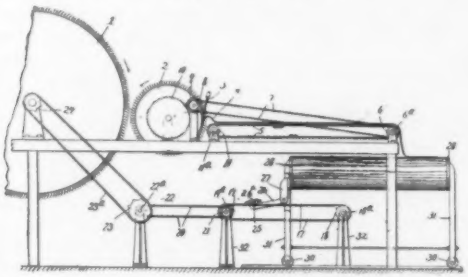
Recent Textile Patents.

BOBBIN COATING Machine. 791,745. Ella H. Bailey, Waterbury, Conn., assignor to Draper Co., Hopedale, Mass.

CARDING MACHINES, Bat Forming and Delivering Device. 789,772. Emil Tyden, Hastings, Mich.

The purpose of this invention is to provide in a carding machine improved means for carrying the film from the doffer or final card cylinder and delivering it to the blamire to form the bat or "blanket," and improved means for operating the blamire in its reciprocating movement.

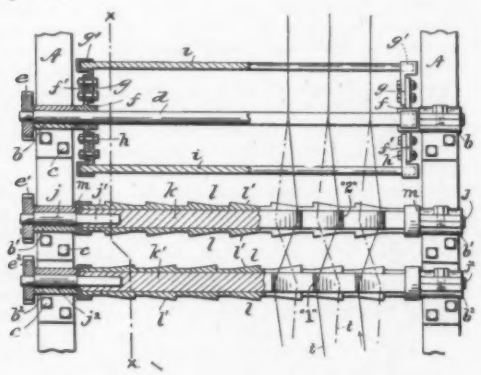


The drawing is a side elevation of the delivery end portion of the carding machine, showing the main cylinder and parts subsequent thereto, including the delivery mechanism in which the improvements are contained.

DESIGNS ON VELVETS, Machine for Cutting. 792,746. Jean F. M. Riffard, St. Etienne, France.

DRESSING MACHINE, Thread. 791,686. Geo. A. Fredenburgh, Pawtucket, R. I.

This invention relates to an improved construction of parts forming a means adapted for finishing or polishing the thread during its feeding movement on a thread-dressing machine, and consists in the novel construction and combination of parts.



The accompanying drawing is a view, partly in central longitudinal section and partly in front elevation, of this improved means for finishing or polishing the thread on a thread-dressing machine.

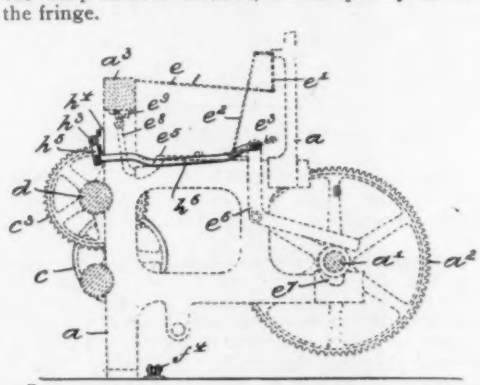
DYEING APPARATUS. 791,148. Chas. M. Hanson, Peacedale, R. I.

LOOM for Fancy Leno Weaving. 791,579. Frederick F. Roche, Lincoln, R. I., assignor to Manville Co., Providence, R. I.

LOOM HEDDLE Mechanism. 793,025. Andrew Weimar, Philadelphia, Pa., assignor of one-half to William D. Weimar, Philadelphia, Pa.

LOOMS, Fringe Pulling Mechanism for. 791,487. Patrick McPeak, Cheltenham, Pa.

This invention has relation to a fringe-pulling mechanism for looms, and relates more particularly to means for preventing the stopping of the loom by the weft stop-motion at the time the fringe is to be pulled and permit of the acceleration in the revolution of the take-up roll of the loom to feed the warp-threads forward, so as quickly to form the fringe.



The principal object of the invention is to provide means controlled by the drop-box mechanism and actuated by the operating-lever of the weft stop-motion of the loom to rotate the take-up roll independent of its usual driving mechanism for a short distance to form the fringe by the rapid forward feel of the warp-threads.

The illustration is a vertical sectional view of a portion of a loom illustrated in dotted lines, and also showing in full lines a portion of the fringe-pulling mechanism embodying the main features of the invention.

LOOM, Jacquard Mechanism. 792,983. Thomas H. Halton and Thomas M. Morrow, assignors to Thomas Halton's Sons, Philadelphia, Pa.

LOOM for Leno Weaving. 791,580. Frederick F. Roche, Lincoln, R. I., assignor to Manville Co., Providence, R. I.

LOOM, Pile Fabric. 791,678. John F. Dustin, Springfield, Mass.

MEASURING DEVICE, Cloth. 790,934. William A. Taylor and Theodric R. Churchwell, Cumby, Tex.

LOOM TAKE-UP Mechanism. 789,816. Charles E. Nutting, Hopedale Mass., assignor to Draper Co., Hopedale, Mass.

WOVEN FABRIC. 790,205. Harry Hardwick, Philadelphia, Pa., assignor to Ivins, Dietz & Metzger Co., Philadelphia, Pa.

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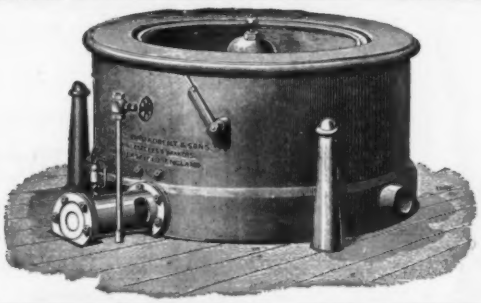

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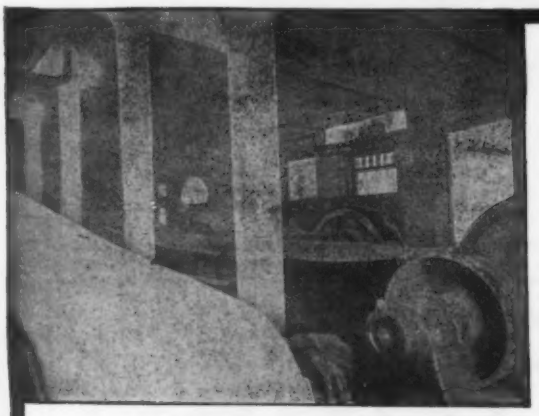

JAMESTOWN, N. Y., Oct. 27, 1904.

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I have used Cling Surface here for five years and am entirely satisfied with it. These belts are clean, not sticky, pliable and in fine condition and the larger is running with a sag of 4 ft., while the smaller is 22" slack. I believe in slack belts and Cling-Surface permits me to run them so.

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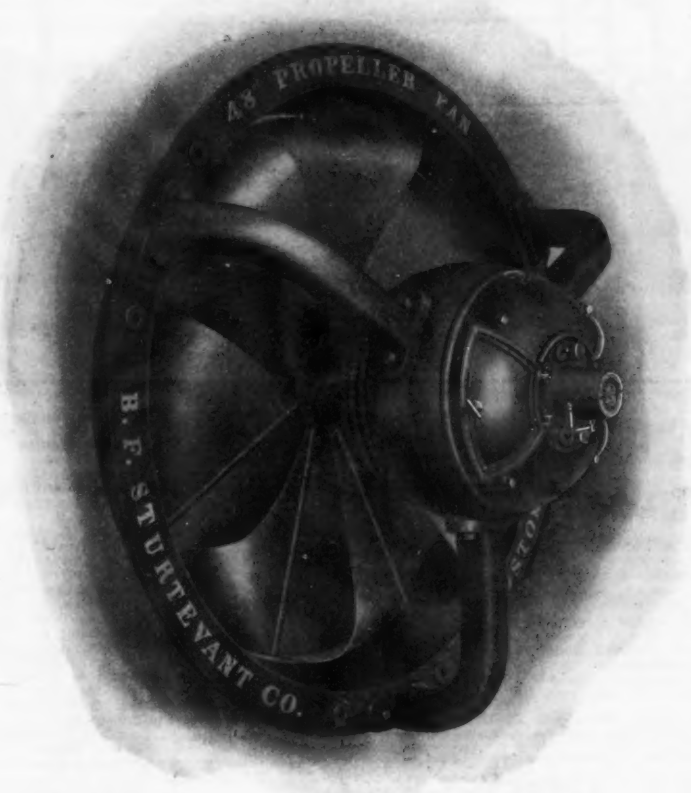

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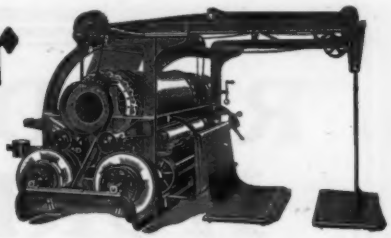
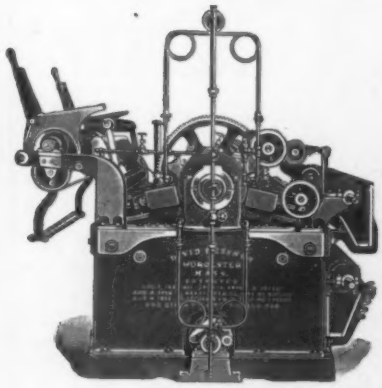
David Gessner

Worcester, Mass.





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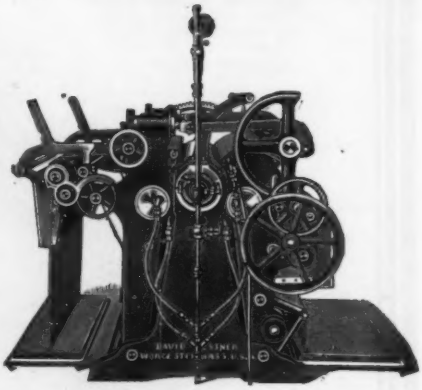

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Dodge Cold Storage Co., United Telpherage Dept.
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Merrow Machine Co., The.
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Wardwell Needle Co.

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Hepworth, John W. & Co.
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Schofield, Geo. L.
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Whitin, The D. E. Co.
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Elliott & Hall.
Fabric Measuring & Packaging Co.
Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.
Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
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Murray Iron Works Co.
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Sturtevant, B. F., Co.
Suck, Adolph.
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Eureka Fire Hose Co.
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Morris & Co.
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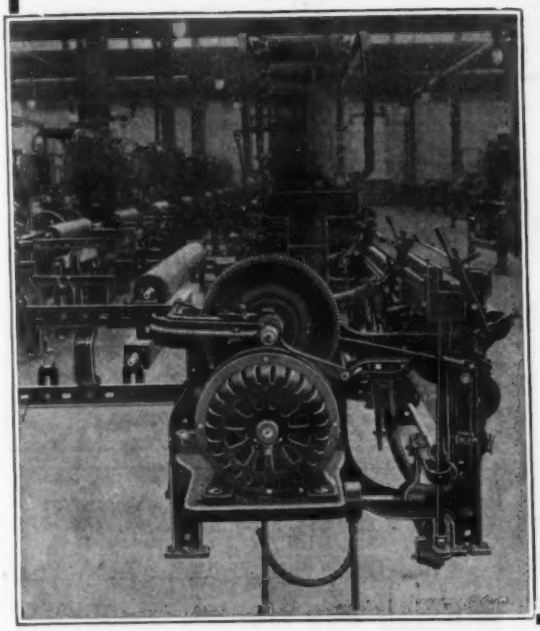

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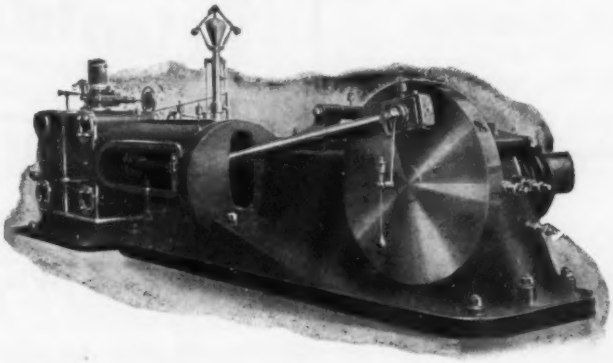

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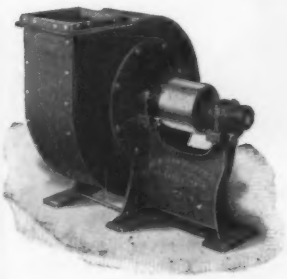

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Patents secured in the United States and all other countries. Reissues obtained. Interferences conducted. Suits brought and defended for infringements, and searches made as to the validity of patents. Prepared to give special and expert attention to cases involving knowledge of cotton, wool, leather and metal working machinery, including boots and shoes and electrical, chemical and metallurgical inventions and steam engineering. We have had wide experience in textile patents cases. Correspondence solicited. No charge for preliminary advice. Personal consultation best when possible.

FOR SALE.

Yorkshire Teasel Gigs and Slats

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Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

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WORSTED PLANTS FOR SALE

FRENCH SYSTEM.

One complete plant of one set of drawing and six mules. (3,600 spindles.)

One complete plant of two sets of drawing and 14 mules. (8,000 spindles.)

Also two sets of drawing separately and 9 mules of 600 spindles each, and one mule of 400 spindles.

The above plants and machinery are now in operation and in first-class condition, containing all the latest improvements throughout, having been kept up-to-date in every way, shape and manner. Mostly made by F. J. Grun, who has made four-fifths of the French system now running in France.

BRADFORD SYSTEM.

One complete plant as a going concern, together with the buildings, which are of modern brick construction, boilers, engines, etc., situated in the state of Connecticut. The plant consists of 21 Cap Frames (3,024 spindles) with the necessary preparation for same, including Carding and Combing and Machine Shop for the manufacture of worsted yarns, which can be delivered in skeins or on dresser spools. This property and plant is thoroughly up-to-date and is a money-maker. Will be sold cheap to the right parties. For further particulars and view of same apply below.

NOTE.—If you are in want of Worsted Machinery, we can no doubt supply any desired machine, as we have the largest stock in New England. Having recently started our own machine shop, we are now in a position to rebuild worsted machinery and modernize same equal to new. We carry in stock a large assortment of mill supplies of the very best materials, also change gears of all pitches.

Speed & Stephenson,

Textile Machinery Dealers.

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Auction Sale of Knitting Machinery of the Virginia Hosiery Mill.

Anderson's Auction Co. will sell on TUESDAY, JULY 25, 1905, at 11 o'clock, at LAMBERT'S POINT, 41st St. and Meyer's Ave., suburbs of Norfolk, the entire contents of the above mill, consisting of a full, complete, modern, up-to-date hosiery knitting plant, comprising Mayo-"Acme," and Scott & Williams Knitters, and McMichael & Wildman, Brinton and Scott & Williams Ribbers, Hepworth Loopers, Dry-Boxes, Presses and auxiliary machinery for manufacturing 500 dozen hosiery per day of ladies' and men's 176 and 188 needle seamless hosiery, also a line of misses' and boys' rib hosiery. Machinery on exhibition five days prior to date of sale. Catalogues on application to auctioneers.

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FACTORY FOR SALE

Payment Taken in Stock or Bonds

Owner of a strictly modern factory in Connecticut, suitable for any manufacturing purpose, would like to meet parties engaging in or contemplating engaging in a manufacturing business, with a view of selling, or contributing same for bonds or capital stock in such business. The factory is absolutely free of incumbrance and is equipped with sprinkler system, electric light plant, boiler, engine, elevator, storage warehouse, barns, artesian well, etc. Owned by responsible parties. Satisfactory references furnished and required.

Address "R. R.," care of The Textile World Record, Boston, Mass.

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Will buy Odd Lots of Yarn of Any Kind
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OF THE

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CHARLES SHONCOOD, Auctioneer, 113-115 Leonard St.

Will sell on MONDAY, July 17th, 1905, at 1 O'Clock, P. M.,

AT NORTH ADAMS, MASS.,

ENTIRE CONTENTS OF ABOVE MILL

CONSISTING OF

Beaming Machines, Crompton Looms, Winding and Quilling Machines, Draper Twisting Machines, 5 and 3 Roll Calender Machines, Gas Singeing Machines, Cloth Spraying Machines, Densmore Sewing Machines, 4 Blade Shearing Machines, Starching and Mangling Machines, Drying Machines, Napping Machines, Cording, Lapper, Warp-float, Cutting, Slubbers, and other machines too numerous to mention.

ALSO

Hydraulic Pump and Press, Donkey Engine, Vats, Ventilators, Emery Wheels, Rotary Fire Pump, 39-inch Hercules Water Wheel, Hydro Extractor, Dean Pump, Vertical Dryer, Steam Brusher, Steam Press, Ball and Beam Warpers, Steam and Boiler Bores, Dyeing Machines, Yarn Print Machines, Fitchburg Cross Compound Condensing Engine (250 H.P.), Harris-Corliss Condensing Direct Connecting Engine, Shafting, Pulleys, Belting, Howe Scales, etc.

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100,000 ft. assorted widths single and double Leather Belting.
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Boilers, Engines, Dynamos, Motors.
Write for Prices.

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Five Saco & Pettee Drawing Frames

OF NINE DELIVERIES EACH.

These frames are 1900 pattern, two heads of five and four deliveries to each frame. Twelve Cans, metallic rolls. Total length of frames 16 feet 3 inches. These frames have been operated but three months and are practically as good as new.

For further particulars apply to **Utica Knitting Co., Utica, N. Y.**

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Suitable for Cotton or Other Manufacturing Industries.

Situated in a growing and prosperous Southern town. Two large railroad systems. Heavy brick building, best construction, slate covered. 30,000 feet floor space. Located on a canal where water power can be used or cheap electric power can be procured from plant nearby. Considerable capital will be contributed by people of town to right party who purchases the property and starts manufacturing business. For full particulars address PAUL GARRETT, Norfolk, Va.

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Have you ever experienced the need of a central distributing point for the eastern field? Many manufacturers now carry stocks of goods here. The best located man often gets the trade. You can RENT Large, Centrally Located Warehouses with attendants, of us, or you can BUY our former plant (we now occupy our new factory), well located for manufacturing or warehouse purposes.

Harrisburg Foundry and Machine Works

MEN WANTED.

Same rates as Wants, For Sale, etc. Manufacturers will be furnished, without charge, with the names of suitable men who are entered on our list, and can usually supply their wants in this way.

Business Opportunity. Reliable and energetic young man, who can invest ten or fifteen thousand dollars, can secure the position of treasurer of a cotton manufacturing plant in the best and most delightful city of the South. Address Millman, care Textile World Record, Boston, Mass.

Wanted. A young man who is familiar with designing and card cutting, for upholstery goods. Apply to "Upholstery," Textile World Record, Boston, Mass.

Wanted. Superintendent for Southern Batting Mill. Must be able to bleach and understand the line thoroughly. Address "American," Textile World Record, Boston, Mass.

Wanted. Woolen Manufacturer to take output of Southern shoddy mill, now in operation. For particulars address "Shoddy Mill," Textile World Record. Boston, Mass.

WANTED

Superintendent for Southern Hosiery Mill, making misses ribbed and ladies 176 needle goods. Present output 1200 dozen daily; to be increased to 2500 doz. fast as possible. Good salary at start and fine opportunity for an experienced up-to-date man.

Address, **Southern,** care Textile World Record, Boston, Mass.

KNITTING FOREMAN WANTED

Automatic, Circular and Flat Sweater Machines in Canadian Mill. Must have A1 references as to character and abilities. Married man preferred. Address "Canadian," care of Textile World Record, Boston, Mass.

Partner Wanted.

A man with practical knowledge and some capital to invest in a long established profitable textile machinery concern, which has grown to such an extent that another man financially interested is needed to share the responsibility, and enable the plant and business to be expanded to meet the demands upon it. A man without direct textile machinery knowledge, but with good executive ability to look after financial and office work, would be eligible. The business is to be incorporated. Only those with capital and requisite ability, should address "R.C.C.," Textile World Record, Boston.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attention to this department. He would be pleased to hear from any of his friends who may be interested.

COTTON SUPERINTENDENTS.

Superintendent or assistant of silk or cotton mill. Worked on plain and fancy ribbons and all classes of goods in broad silks, dress silks and tie silks, also Jacquard work. References. 3185, Textile World Record.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Superintendent of cotton mill or overseer. Handled all kinds and numbers in yarn mills, cloth mills, colored warps, etc. Speeder, warper, spooler and spinner in the family. Age 48; American; married. 3219, Textile World Record, Boston, Mass.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

Superintendent, or overseer of carding. Worked on combed and carded yarn from 20 up to 140, twilled sateens, lawns, sheetings and shirtings. English and American machinery. 3036, Textile World Record.

Superintendent of yarn mill or plain cotton weaving or assistant. 33 years of age; American. Worked on all classes of yarn up to 50s and plain weaving. Married. 3226, Textile World Record.

Cotton Mill Superintendent. Overseer of weaving on mule spindles. Worked on fancy lenos, jacquards, fancy lappets, plain, fine and coarse cotton goods. Age 36; French-American. 3232, Textile World Record.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

Superintendent of cotton mill, spinning or weaving, assistant superintendent or designer or overseer of weaving, plain or fancy goods. Age 28; English; married; first-class references. 3243, Textile World Record.

Assistant Superintendent in an up-to-date cotton mill. Age 26 years. Textile school education. Single, hard worker and of good habits. Would invest in a paying proposition. 3239, Textile World Record.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent. Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds. 1841, Textile World Record.

Superintendent or Designer. Age 37. English. Married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Superintendent of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as superintendent or designer. Age 45; American; married. Good references. 1982, Textile World Record.

Woolen Mill Manager, formerly of Yorkshire, is open to take a similar position in the United States or Canada. 1976, Textile World Record.

General Manager, agent, superintendent or designer. Worked on everything from fine worsted to a blanket. Good experience. Aged 37; American; married. 3172, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Asst. Agent, superintendent or mechanical engineer in woolen or carpet mill of any kind. Age 30; married. Excellent references. 3178, Textile World Record.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent of worsted yarn plant or overseer of drawing and spinning. Worked on Australian, English, domestic woolens, mohair, alpaca, spun from 8s to 70s, also carpet yarn. Age 28; American; widower. First-class references. 3221, Textile World Record, Boston.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Woolen Superintendent of small mill or assistant superintendent in large mills, or boss finisher, by practical mill man raised in the business. Worked through card room, dressing and weave rooms, and all the departments of finishing. Overseer 20 years; strictly temperate; have family; Scotchman. 3200, Textile World Record.

COTTON CARDERS

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

Secondhand Carding or card grinding in a large mill. Worked on all white and colored goods, cotton from 4s to 70s. Good references. Age 29; German; unmarried. 3217, Textile World Record, Boston, Mass.

Overseer Cotton Carding or Spinning desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Overseer of Cotton Carding or superintendent of a small mill. Worked on coarse and fine yarns from 10s to 170s, carded and combed. Will not go West, South or to Canada. Age 37, American. First-class references. 1027, Textile World Record.

Overseer of Cotton Carding. Worked on all kinds of yarn. At present employed in a large mill, but will change for a better position. Familiar with all kinds of machinery. Will not go South. 36 years of age, French. 1991, Textile World Record.

Superintendent or overseer of carding in a large mill. Worked on sheetings, ginghams. Will not go West. Familiar with all kinds of cotton machinery. 41 years of age. American. First-class references. 2021, Textile World Record.

Overseer of Cotton Carding. Worked on plain and fancy coarse and fine white goods. Wants only Rhode Island or Connecticut. 47 years of age, married. First-class references. 1884, Textile World Record.

Second Hand in Cotton Card Room. Worked on all kinds of cotton yarns used for hosiery and sheetings and twills. Familiar with all kinds of carding machinery. German, 28 years of age. Will go any place for a good position. 1718, Textile World Record.

COTTON SPINNERS.

Overseer of Ring Spinning, spooling, long chain beaming, slashing and drawing-in. All kinds of fancies, sheetings, etc. $3.00 per day up. 3202 Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yar ranging from 24's to 160's is open to a position. .. years old; American. Good references. 2003, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans grain bags. 3152, Textile World Record.

WOOLEN CARDERS.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Secondhand in wool card room. Age 23; American. Wool and cotton mixes. References. 3198, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

Second Hand of scouring and carding worsted in a large mill, or overseer in a small mill. Age 24; American; single. First-class references. 3246, Textile World Record.

Woolen Boss Carder. Worked on all classes of goods in hosiery and woolen mill. Familiar with Davis & Furber, Furbush & Cleveland cards; first-class references. Age 35, married. 1501, Textile World Record.

Woolen Boss Carder, or would accept a position as traveling machinist in setting up machinery. Worked on all classes of woolen goods, shoddy mixes, cotton mixes. Worked on Davis & Furber, Cleveland, Lombard, Platt Bros., Furbush & Smith machines. First-class references; age 47; married. 1578, Textile World Record.

Woolen Boss Carder. Worked on all classes of woolen goods, hosiery, dress goods, felts, blankets, cassimeres, satinets, slasher and roller cloth. Age 38; first-class references. Could take a position at short notice. 3258, Textile World Record.

Second Hand in woolen card room. Worked on all kinds of woolens, shoddy and cotton mixes; first-class references. Would take a position in one week's notice. American, age 20. 3241, Textile World Record.

Woolen Boss Carder. Worked on all classes of woolen goods, all wool, all cotton, and cotton and woolen and shoddy mixes. Familiar with all kinds of American carding machinery. First-class references. Age 44, married. 1953, Textile World Record.

Woolen Boss Carder. Worked on all classes of union, cassimeres, beavers. Familiar with all classes of stock. Will not go West. Age 35, married; first-class references. 3174, Textile World Record.

WOOLEN SPINNERS

Overseer Woolen Spinning. Cassimeres, beavers, kerseys, dress goods, flannels, etc. Good experience. 3177, Textile World Record.

Boss Woolen Spinner. Would take a good secondhand job. Used to Davis & Furber and Johnson & Bassett machines. Worked on all kinds of goods. First-class references. 3215, Textile World Record, Boston.

Woolen Boss Spinner. Worked on all kinds of woolen goods. Familiar with Davis & Furber, Johnson & Bassett and Woonsocket mules. A first-class fixer. Could take a position at once. American; age 48. 3266, Textile World Record.

Woolen Boss Spinner, or would accept a good second-hand position. Familiar with all kinds of American spinning machinery; Davis & Furber, Johnson & Bassett, English mules, Curtis and Platt. First-class references; age 48, English. Could take a position at once. 589, Textile World Record.

Woolen Boss Spinner. Worked on all kinds of woolen yarns; worked on Davis & Furber, Johnson & Bassett, Bridesburg, Platt, and Lees & Moulton machinery. First-class references; English; 45 years of age. 3223, Textile World Record.

COTTON WEAVERS.

Overseer of Weaving. Good experience and reference. Worked on lawns, sheetings, sateens, dimities, fancies, etc. 3188, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin, Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Overseer of Weaving. Worked on all kinds of cotton goods, plain and fancy, including Turkish and cotton towels, also fancy worsted dress goods. Age 39; English; married. 3236, Textile World Record.

Overseer of Weaving or loom fixing. Worked on cotton, woolen, silk. Used to Crompton & Knowles looms, both box and plan, Lewiston looms, Mason, Colvin, Whiting, Patterson, etc. Age 43; Scotch; married. 3216, Textile World Record, Boston.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Cotton Boss Weaver, or would accept a position as superintendent or assistant superintendent. Worked on all kinds of sheetings, shirtings, lawns, cambrics, ginghams, checks, stripes, union goods, awnings, ducks, light and heavy weight plain and fancy flannels. American, 39 years old. First-class references. Will go any place for a good position. 3257, Textile World Record.

Overseer of Weaving. Worked on dobbies, fancy shirtings, madras, ginghams, twills and white goods. Will not go West or to Canada. 47 years old, married. First-class references. 3065, Textile World Record.

Assistant Designer, or assistant in the weave room. Worked on plains, twills, sateens and dobby cloth. Familiar with Stafford, dobbies and Whitin looms. Will not go South or West. First-class references. 21 years of age. English. 3230, Textile World Record.

Overseer of Cotton Weaving. Worked on lenos, checks, plaids, fancy stripes, drop box and plain looms. First-class references. Will not go West or to Canada. Age 36, English. First-class references. 1855, Textile World Record.

Foreman of Weaving. Worked on ribbons of all descriptions, silk and cotton labels, tapes and lenos. Will not go to Canada or Maine. Age 34, American. First-class references. 3183, Textile World Record.

Overseer of Weaving, superintendent of weaving or designing. Worked on all kinds of cotton dress goods, also suitings. Familiar with all kinds of American and English looms and machinery. Age 41, English, widower. First-class references. 2058, Textile World Record.

Overseer of Cotton Weaving. Worked on all classes of fancy goods, such as lenos, handkerchiefs, and almost everything in the line of cotton. Can do his own designing. Age 35, married. First-class references. 1642, Textile World Record.

Superintendent or boss weaver in a cotton or woolen mill. Worked on sheetings, shirtings, ginghams, plaids, checks, cottonades and figured jeans. Familiar with all kinds of machinery. 45 years of age. First-class references. 1806, Textile World Record.

Loom Fixer or second hand in weave room. Worked on all kinds of mixed goods, cotton and woolen dress goods, fine lenos, Jacquard and drop box looms. Age 33, French, good references. 3265, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3182, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Woolen Boss Weaver. Worked on worsteds, woolens of all kinds, also dress goods. American; 38 years of age; married. 3231, Textile World Record.

Woolen Boss Weaver. Worked on plain and fancy piece dyed worsted, woolen, plain and fancy flannels, also fancy mercerized rain cloths. 29 years of age; Canadian; married. First-class references. 3251, Textile World Record.

Overseer of Weaving. Worked on worsteds, cassimeres, dress goods, and all kinds of woolen goods. Crompton & Knowles looms. First-class references; American. 45 years of age. 3262, Textile World Record.

Boss Weaver or assistant superintendent. Familiar with all classes of woolen goods except worsted. Crompton & Knowles looms. Age 48, married, American. 886, Textile World Record.

Loom Boss or designer. Familiar with blankets, flannels, skirtings, worsteds, woolens and piece dyes. Familiar with Crompton & Knowles jacquard and dobby looms. Age 33, married, American. 3150, Textile World Record.

Overseer of Weaving or designing. Worked on all classes of woolen goods, thibets, meltons, kerseys, worsted and cotton worsteds and cassimeres. Familiar with Crompton & Knowles looms. Age 42, married. First-class references. 2051, Textile World Record.

Assistant Superintendent or boss weaver. Familiar with fancy worsteds, cassimeres and cheviots, dress goods and suitings. Can do designing. Familiar with all kinds of woolen machinery. First-class references. Age 38, married. 1712, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Overseer of Weaving, or would consider a good loom fixing job in a woolen mill. Age 47; Protestant; good references. 3247, Textile World Record.

Young Man, American, wants position as boss weaver or assistant superintendent. Has worked on fancy worsteds, cassimeres and cheviots. Can also design. 1712, Textile World Record.

Loom Boss. Age 32; American; married. Also a designer. Knowles, Crompton, Jacquard and dobby looms. Wants $3 per day. 3150, Textile World Record.

Boss Weaver or assistant superintendent. Familiar with all kinds of woolen, worsted, silk and cotton tapestry. Age 35; German-American. First-class references. 3119, Textile World Record.

Overseer of Weaving or designer. Familiar with all kinds of dress goods, lenos, lappets or any kind of fancy Jacquard weaving. Understands all kinds of English and American machinery. Age 46, English. First-class references. 3267, Textile World Record.

DESIGNER

On Narrow Fabrics and Elastic Webs wants position. Address "Designer," care Textile World Record, Philadelphia, Pa.

Designer on any class of dress goods, waistings, mantle cloths, fine shirtings, etc. 3203 Textile World Record.

Assistant Designer or asst. superintendent. Dress goods and men's wear. Age 25; Austrian; unmarried. Wants position in Philadelphia or suburbs. 3193, Textile World Record.

Designer on cotton, or assistant on woolen, worsted or Jacquard work. Age 31; American; unmarried. 3190, Textile World Record.

Assistant Designer on cotton or assistant in the weave room. Worked plain twills, sateens and dobby cloth. Age 21; English; single. 3230, Textile World Record.

Assistant Superintendent or designer. Familiar with worsted dress goods, fancy cotton lenos, cotton worsted men's wear, high grade fancy worsteds and piece dyed men's wear. Familiar with all kinds of woolen machinery. At present employed, but wishes to change for a better position. Age 34, single. First-class references. 3254, Textile World Record.

Cotton Designer, weaver or assistant superintendent. Worked on all kinds of fancy lenos, Jacquard effects. First-class references. English, 33 years old. 1397, Textile World Record.

Designer or assistant. Worked on all classes of woolen and worsted goods, worsted mercerized men's wear and dress goods. Familiar with all kinds of woolen machinery. First-class references. Age 26. 3127, Textile World Record.

Designer. Understands all kinds of worsted and woolen goods for men's or women's wear. Could take a position at once. Age 28 years. First-class references. 3264, Textile World Record.

DYERS.

POSITION WANTED

by **Boss Dyer for Knit Underwear** or will take second hand position. 18 years experience. Will guarantee to produce good results. Address "Knit Dyer," care Textile World Record, Boston, Mass.

First-Class Hosiery Dyer wants position. 25 years' experience on fast black and aniline colors. Temperate; references. Western States preferred. Address "Hosiery Dyer," Textile World Record.

Wanted. Position by dyer's chemist, as such, or as dyer. Had sound technical training at the Leeds University, Eng. Took honors City & Guilds, London, for wool and cotton dyeing. Experienced in handling help. Address "Chemist," Textile World Record, Boston, Mass.

Dyer on all grades of worsteds, kerseys, broadcloths, knit goods of all descriptions, alpacas, mohair lining, ladies' dress goods, worsted yarn, cotton yarn, wool and cotton raw stock. Age 41; English-American. 3214, Textile World Record, Boston.

Secondhand Dyer. Yarn and cotton pieces. Experienced on all classes of goods on a small scale. Age 23; unmarried. 3171, Textile World Record, Boston.

Overseer of Dyeing on all classes of worsted, woolen and union goods. Can take position on two weeks' notice. Age 26; American; single. First-class references. 3224, Textile World Record, Boston.

Secondhand in dyehouse. Would accept a position as salesman. Worked in first-class worsted and woolen mills. Age 26; American; unmarried. Can take place on short notice. 3211, Textile World Record, Boston.

Overseer of dyeing and finishing, all kinds of worsteds, woolen, fancy mix, indigoes, and raw stock. 36 years of age; married. 3233, Textile World Record.

The Textile Department

International Correspondence Schools,

NEW BEDFORD, MASS.,

C. P. BROOKS, - - - Principal

Trains men for higher positions in textile mills. If you are interested, cut out this coupon, mark, and mail it to

TEXTILE DEPARTMENT,

International Correspondence Schools,

Box 836, NEW BEDFORD, MASS.

Please send me printed matter regarding your courses of instruction and explain how I can qualify for position before which I have marked **X**.

Cotton Mill Agent	Textile Designer
Boss Cotton Carder	Boss Weaver (fancy cot)
Yarn Mill Supt.	Cotton Designer
Boss Spinner (cotton)	Woolen Designer
Boss Weaver (plain cot.)	Woolen Mill Supt.
Fixer (fancy cotton)	Boss Woolen Carder
Cotton Mill Supt.	Boss Woolen Weaver

Name.

Occupation. Age.

House Address.

Business Address.

City. State.

DO IT NOW

MISCELLANEOUS.

Beamer. Experienced young man, good worker, also fairly good warper, weaver and twister, desires position. No objection to distance. Address Beamer, Textile World Record, Boston, Mass.

Boss Dresser wants position as overseer of dressing, spooling, winding and twisting, assistant designer or assistant superintendent. Age 33, Scotch. Married. Textile graduate. 18 years of practical experience on all kinds of woolen and worsted fabrics for suitings, overcoatings and dress goods. First-class references. 3076, Textile World Record.

Business Manager, superintendent or agent. Understands the manufacture of sweaters and hosiery. Familiar with all kinds of machinery, and would like to meet a party with capital to invest in knitting business, to manufacture a specialty; little or no competition and good prospects. 31 years of age, American. First-class references. 3260, Textile World Record, Boston, Mass.

Boss Knitter or second-hand in an underwear mill. Familiar with silk, worsted, cotton and mixed yarn of all kinds. Will not go West, South or to Canada. 32 years of age, American, married. 1819, Textile World Record, Boston, Mass.

Superintendent of Ribbed Underwear Mill. Finisher or salesman. Familiar with all kinds of ribbed goods. All kinds of ribbed machinery. Would prefer a position in the South. Age 38, married, American. 2036, Textile World Record.

Overseer of Knitting Ribbed Goods, boss finisher or machinist. Worked on nearly all kinds of knit goods; underwear only. 36 years of age, married, American. 889, Textile World Record.

Foreman of Finishing in knitting mill. Familiar with plain and ribbed goods for ladies and gentlemen. Familiar with all kinds of sewing machines used in underwear finishing. 38 years of age, married. Could take a position in ten days' notice. 3253, Textile World Record.

Drum or frictional winding is illustrated by several styles of machines, including those known as Coombs, Hetherington, Foster, Dobson & Barlow, Broadbent, Stubbs, Camless, Hill & Brown, etc -- these machines varying in structure but all producing a package having large, IRREGULAR SPACINGS into which the succeeding coils of yarn are PRESSED by contact with the FRICTION ROLL OR DRUM.

In FRICTIONAL WINDING, the tube or CONE HOLDER IS WEIGHTED so that it will rotate by CONTACT WITH THE DRUM AND WIND THE YARN AGAINST THE RESISTANCE OF THE TENSION. A full sized cone of yarn adds over two pounds to this pressure during the process of winding, making the pressure on the package that much greater at the completion of the winding.

In UNIVERSAL WINDING, PRESSURE is DECREASED as the cone increases in size and the yarn is not crushed or strained nor its elasticity impaired.

UNIVERSAL WINDING CO.,

95 South Street - Boston.

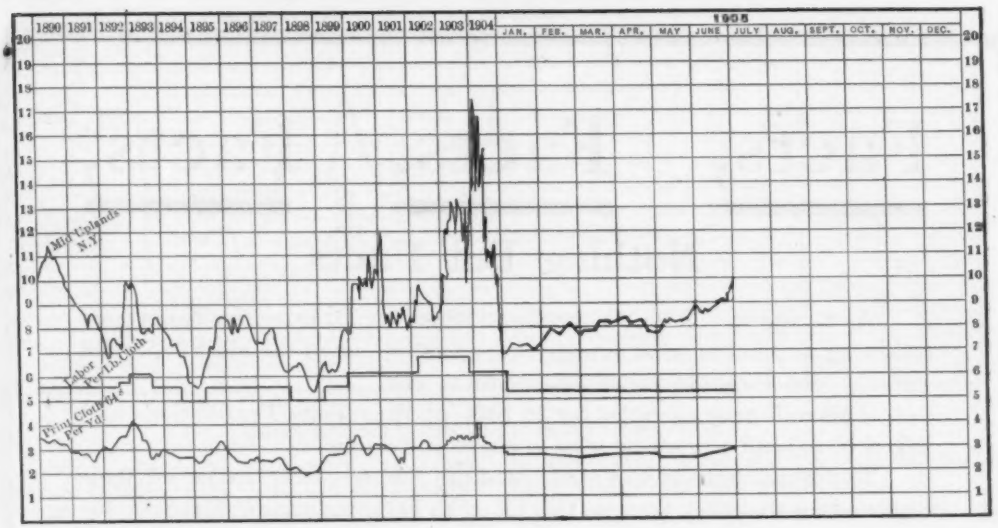

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloths 64 x 64 Per Yd.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

The price of cotton has been moving steadily upward for the last two months, in fact, barring temporary recessions, ever since the first of January. As in most rising markets, bullish sentiment gathers strength with the advance. Mills all over the world are running to their full capacity with orders far ahead. It is not difficult to appreciate the weight of the argument that the extraordinary requirements of manufacturers for this season's business and the replenishing of supplies will take care of the surplus in the event of no more than an average crop now growing. In the last days of June the 10c. mark was crossed.

Manufacturers are finding buyers less averse to paying prices for yarn and cloth commensurate with market prices for cotton. Indeed, deliveries rather than prices are the immediate factors of sales. This puts the manufacturer in a very different position from that of 1903-1904, when cotton manufacturing was based more on speculation than on legitimate business methods. Print cloths have advanced to 3c. for regulars with small stocks on hand. The cotton cloth situation is one of great strength.

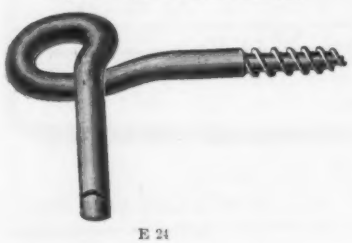
Europe's takings of cotton, as compared with those of the United States, show a much greater proportion of the increased total takings than the ratio of spindles. These figures indicate a greater depletion of stocks abroad at the beginning of the season, so that their requirements are much greater than are those of the American manufacturer or else that the latter have less need or less anxiety regarding their future requirements.

MITCHELL-BISSELL CO.

38 MURRAY STREET, NEW YORK.

PORCELAIN, ENAMELLED IRON AND GLASS FOR TEXTILE MACHINERY.

Right Angle Pontiac Guide.



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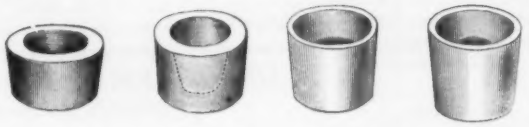


143 704 258 5219

Creel Steps.

E 8

Facts, Facts, Facts,

Nothing But Facts

As Experience is the teacher from whom we all learn, we believe the following account of what actually happened at one of the most important mills in New England will be of interest to you.

This mill gave an order for 10 bbls. of Wyandotte Textile Soda and asked us to send a practical man to prove our claims.

The demonstration was made, and the results so far exceeded their expectations that they thought this lot of 10 bbls. was made especially for this demonstration. They used no more from this shipment, but set aside what remained and gave another order for an additional 10 bbls. which they tried themselves according to the instructions given by our practical man. This second test proved equal if not better than the first, owing to the fact that they were becoming more accustomed to the use of Wyandotte Textile Soda.

The outcome was, that to-day they are carload buyers of Wyandotte Textile Soda and would not return to former methods should they be compelled to pay twice the present cost for Wyandotte Textile Soda.

This is a positive statement and the experience of but one mill from the many which are now using Wyandotte Textile Soda.

None Genuine except with a card bearing this Trade Mark

In Every Package.

If you are not using Wyandotte Textile Soda successfully can you afford to delay this important matter?

Order from your supply house and write us when we can send one of our practical men to prove these claims.

THIS SODA WAS AWARDED THE HIGHEST PRIZE—GOLD MEDAL—AT THE ST. LOUIS EXPOSITION.

The J. B. Ford Co.,

SOLE MANUFACTURERS,

Wyandotte, Mich.

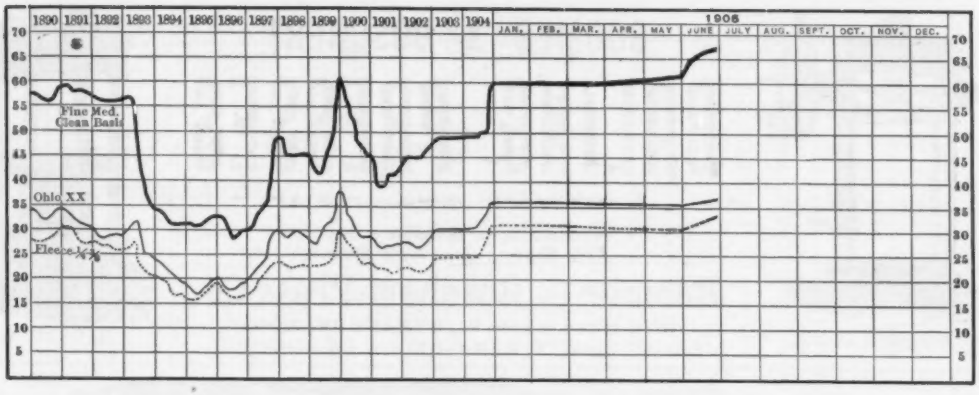


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

Estimated spindles in the world, 1903...110,600,000
Estimated spindles in the U. S., 1903.... 22,200,000
Per cent. for the United States..... 20

Total exports to Europe, Sept. 1, 1904, to June 23, 1905....8,043,882
Total exports for the same period, 1904-1905 5,827,193

Increase in exports..... 2,216,689
Takings of Northern and Southern mills, Sept., 1904, to June 23, 1905.....3,932,324
Takings of Northern and Southern mills for the same period, 1903-1904.....3,812,967

Increase in United States takings 119,357
The total increase in exports and takings of the United States 2,336,046

Proportion of increased takings exported, about 95 3/4 per cent.

Proportion of increased takings by American mills, 4 1/4 per cent.

Put in another way, comparisons are as follows:

	Total Exports.	Taking Am. Mills.
1899-00	5,946,000	3,749,000
1900-01	6,538,000	3,649,000
1901-02	6,642,000	4,197,000
1902-03	6,675,000	4,039,000
1903-04	6,032,000	4,020,000
Average	6,366,000	3,931,000
Per cent.	61	39

Sixty-one per cent. of the 1904-05 crop, estimated at 13,500,000 bales, would be 8,235,000. The exports have almost reached this figure, but American mills have fallen far short of their proportion of 39 per cent., which would amount to 5,265,000 bales, against 3,812,967 actually taken.

The Chronicle estimates the total visible world's supply on June 23 at 3,570,314 bales, as compared with 2,172,234 bales in 1904, 2,347,198 bales in 1903 and 2,509,053 bales in 1902.

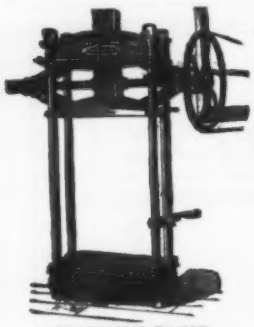
Wool Market.

"Firm and quiet" is the brief summing up of the wool market. Manufacturers have hesitation in buying for next season's requirements at present prices. Those mills with heavy weight orders still on hand, and duplicate orders in prospect, who have not already covered their requirements are doing so, thus making fair total sales. There is also some trade among dealers, many of the smaller concerns having to buy stock from the large traders in order to get wool to do business with.

The sentiment in the wool trade is certainly bullish, and it is difficult to withstand their feeling of supreme confidence in the statistical position and of other conditions that tend for present and even higher prices. It has been reported and confirmed that several million pounds of the 1906 clip have already been contracted for by Boston dealers. They certainly show the courage of their convictions.

In considering the law of supply and demand it must not be forgotten that the ultimate source of the demand comes from the consumer, who has the option of paying the price or going without, and this long suffering person has been known to

Wool and Woolen Goods Made **NONSHRINKABLE**
by the use of "Nevershrink Process."
May be applied at any stage of manufacturing. Write for Booklet.
CHARLES H. HEYER,
1501 Real Estate Trust Bldg. Philadelphia, Pa.
FOR WOOL Nevershrink PROCESS.



KNUCKLE JOINT.

BOOMER & BOSCHERT

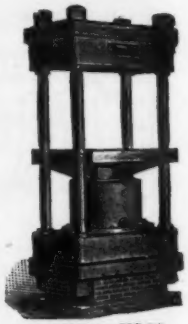
BALING PRESSES

ARE THE STANDARD

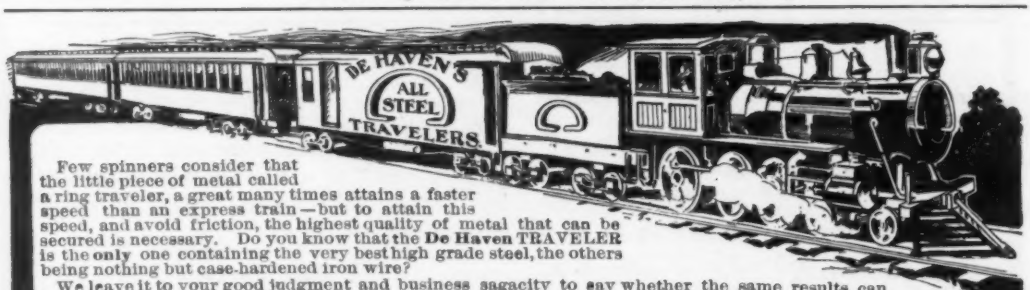
Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.
Southern Agent, A. H. WASHBURN, Charlotte, N. C.



HYDRAULIC.



Few spinners consider that the little piece of metal called a ring traveler, a great many times attains a faster speed than an express train—but to attain this speed, and avoid friction, the highest quality of metal that can be secured is necessary. Do you know that the **De Haven** TRAVELER is the **only** one containing the very best high grade steel, the others being nothing but case-hardened iron wire?

We leave it to your good judgment and business sagacity to say whether the same results can be obtained from case-hardened iron as with high grade steel, under the conditions which govern ring spinning.

DE HAVEN MFG. COMPANY,
50-52-54 Columbia Heights, Brooklyn, N. Y.

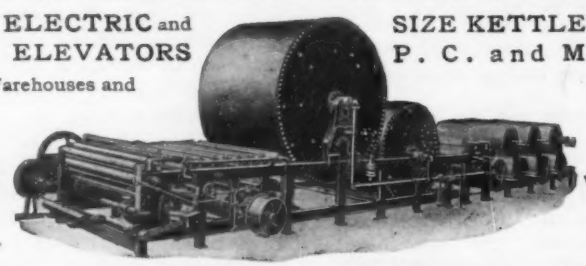
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS

WATERWHEEL GOVERNORS.

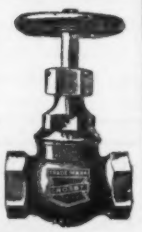
The COHOES IRON FOUNDRY & MACHINE CO., Cohoes, N. Y.

A Rigid Examination Reveals No Defects in the

CROSBY SPRING-SAVE GLOBE AND ANGLE VALVE.

NO BETTER VALVE CAN BE MADE.

All Working Parts Renewable Without Removal from Piping. ALL PARTS INTERCHANGEABLE. THEY have a full opening through them. WHEN COMPLETED ARE TESTED under more than 400 lbs. pressure. We guarantee them NOT TO LEAK AT HIGH PRESSURES. MADE IN BRASS AND IRON in the various styles furnished to the trade. **Try One or More Valves and BE CONVINCED.**

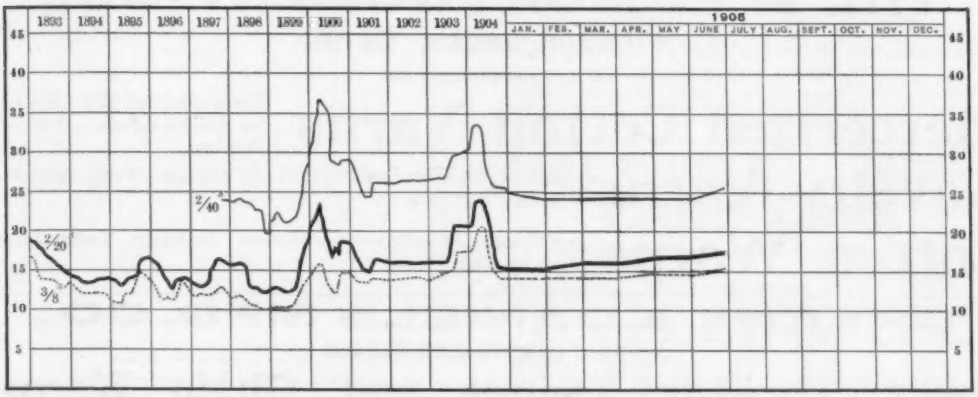


CROSBY STEAM GAGE AND VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

go without. Although present conditions are different from those of 1899-1900, a study of the chart is interesting. The conservative manufacturer thinks it is wise to go slow.

Wool is held in strong hands and no concessions are being made to induce sales. Much of the new wool is going directly to the manufacturers, having been sold ahead, so the offerings of actual spot wool are much more limited than usual at this time.

The large London sales taking place as this issue is in press will undoubtedly have an important influence on prices. Imports continue to run ahead of the corresponding periods last year. For the first time in a long period imports of woolen fabrics are showing an increase, although the gain for April, 1905, is not large, being $1,180,342, as compared with $847,842 for 1904. Most of the increase is on dress goods.

Eastern Yarn Market.

The advance in cotton has been closely followed by an advance in price of cotton yarn, in some cases it has exceeded it, especially in weaving and hard yarns, which are in great demand. It is difficult to get prompt deliveries, as most mills are sold up for weeks ahead and it is decidedly a spinners' market. The strength of the cotton cloth market has encouraged spinners in their stand for high prices, fully as much as the rise in cotton.

Much fine yarn is going to worsted mills for twist.

While soft yarns are not quite in such active demand, prices are firm and knitters are covering their requirements whenever they see an opportunity of so doing. Some knitters who priced their lines too low are taking long chances in the hope of something turning up in their favor, and holding off. Complaint is heard in the yarn trade that some Southern mills have gone wild on the subject of prices, but it depends largely on the point of view. Prices are affected today by the cotton quotations and more particularly by the need of the buyer for quick or slow delivery. We quote as follows:

Eastern Cops.

6's	15½
8's	15½
10's	16
14's	17
16's	17½
18's	18
20's	18½
22's	19
24's	19½
26's	20½
30's	22
34's	23
36's	24
40's	25

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	18
14's	19
18's	20
20's	21
24's	22
26's	24
30's	25
36's	26
40's	28
45's	30
50's	33
55's	37
60's	41

Eastern Two-Ply Warps, Carded Peeler.

2/30's	26
2/36's	26½
2/40's	28½
2/45's	31
2/50's	34
2/60's	43

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

WALCOTT & CAMPBELL SPINNING COMPANY

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.

HIGH GRADE HOSIERY YARN

White and Colors. All Numbers.

Sewing Twines on Cones and Tubes.

SPECIALTIES IN WEAVING YARN.

Black and white. Double and twist for woolen trade.

CANNON MILLS, 55 Leonard St New York.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.

The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	31
36's	32
40's	36
45's	39
50's	42
55's	45
60's	48
70's	58

Two and Three Ply Skeins, Combed.

30's	36
36's	38
40's	40
45's	43
50's	46
55's	49
60's	52
70's	62

Philadelphia Yarn Market.

There has been an unusual demand for yarn the past few weeks. This demand, together with the advance in cotton, has caused a sharp advance in the price of yarn. Stocks are small in nearly all numbers, particularly on 2-ply warps and skein. Spinners are generally well sold up for the summer months, which will probably keep the price on yarn steady until new cotton is in the market.

The advance in cotton has stimulated the yarn business, and customers have been buying freely the past two or three weeks. This advance was unexpected and a surprise to most all users of yarn, but while it is largely of a speculative nature, prices can undoubtedly be held up for at least the next two months. Prices at time of writing are about as follows, but subject to quick changes from day to day:

Southern frame spun cones:—

7's and Coarser	16
8's and 9's	16
10's	16
12's	16½
14's	17
16's	17½
18's	18
20's	18½
22's	19
24's	19½
26's	20
30's	20½
40's	26
50's	32

Southern high grade mule yarn:—
Cones.

10's	17¼
12's	19½
14's	18¼
16's	19
18's	19½
20's and 22's	20-20½
24's	21

Southern frame yarn, lower grades:—

6's and 8's	15½
10's	16

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS
MERCERIZED YARNS } ALL NUMBERS FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

SPINNING MILLS:
NEW BEDFORD, FALL RIVER, TAUNTON.

DYE AND BLEACH WORKS:
FALL RIVER, TAUNTON.

NEW ENGLAND COTTON YARN CO.

KNITTING AND
WEAVING YARNS

EVERY DESCRIPTION AND FORM
Gray, Bleached, Dyed and Mercerized
600,000 MULE AND FRAME SPINDLES

C. MINOT WELD, President.
HENRY C. SIBLEY, Treasurer.

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Executive Office:
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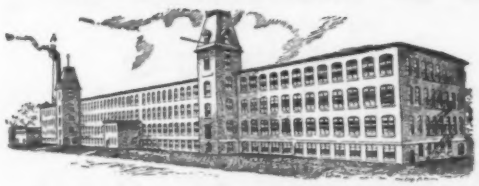
BRANCH OFFICES:
ALBANY, Broadway, cor. State St.
CHICAGO, cor. Clark and Adams St.
NEW YORK, 73 Worth St.
PHILADELPHIA, 213 Chestnut St.

C. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS



Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

JENCKES SPINNING CO.,

Formerly E. JENCKES MFG. CO.

Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.

PAWTUCKET, R. I.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

Indian Orchard Company

Cotton Warps and Yarns. In Gray and all Colors, Single or Two or more Ply and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with Wool, Machined or in Roving.

Indian Orchard, Mass.

E. MORGAN, PRES. J. H. K. WRIGHT, TREAS. W. C. GODFREY, AGT.

Eastern cones (high grade quality):—

10's	17½
12's	18
14's	18½
16's	19¼
18's	19¾
20's and 22's	20¼-20¾

Skein yarn (mostly Southern):—

4's to 8's soft	15½
10's to 12's	16-16½
14's to 20's	17-18½
22's	18½
14/2	17
16/2	17½
20/2	18½
30/2	21
40/2	26
16/3 slack	17½
12/3 slack	17
8/3 carpet	16
8/3 slack	16
9/4 slack	16

Warps (Southern):—

10's to 12's	16
14's	16½
16's	17
20's to 22's	17½-18
26's	18½
14/2	17
16/2	17½
20/2	18½
24/2	19½
30/2	21
40/2	26½

Mixed colored yarns (mock twist, half colors):—

6's to 10's	17-17½
12's to 14's	18-18½
16's to 18's	19-20

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

The majority of spinners have orders enough to last until about September 1st, and by that time they figure that the light weight season on men's wear will have developed and the weaver will know what grade of yarn is to be required and also if they can get business at the prices spinners must get for yarn. In the meantime spinners insist on getting full prices and will not take orders without first covering themselves with wool.

Spinners are not urging customers to place orders. They state to prospective customers that they are very anxious to meet their ideas as to prices, but that the basis of yarn prices is the price of wool, that they will give customers all possible advantages in their wool purchases, but if they are unable to come out at least whole in their transactions, the mills will shut down. Many spinners are advising customers to hold off the market in the belief that during the summer prices may soften.

The coming season is to be a worsted season; the demand is for smooth finished cloth. But for all it is a worsted season the use of worsted yarn

O. K. SOAP CO.
MANUFACTURERS
FINE TEXTILE SOAPS,
SILKINE,
AND LISLE SILK FINISH
For Fast Black and Colors. Softness and lustre.
Write us to-day.
968 North Franklin Street, - PHILADELPHIA.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps,
Cones, Cops,
Tubes
COTTON YARNS
426 and 428
Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job
Gassing, Winding, etc. All Numbers.
GASSED .·. YARN .·. SPECIALTIES

American Cotton Yarn Exchange
COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
American, Egyptian,
Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y., with James Talcott.

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
54 FRANKLIN STREET, NEW YORK

Pocasset Worsted Company,

WORSTED YARNS

IN THE GRAY.

Mills at
Thornton, R. I.

Office
100 Boylston St., Boston, Mass.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors,
in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

BUYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. **B. F. BOYER CO.,** Bradford System.

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills,
Loridan Worsted Co.,

300 Chestnut St., PHILADELPHIA, PA.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.
Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

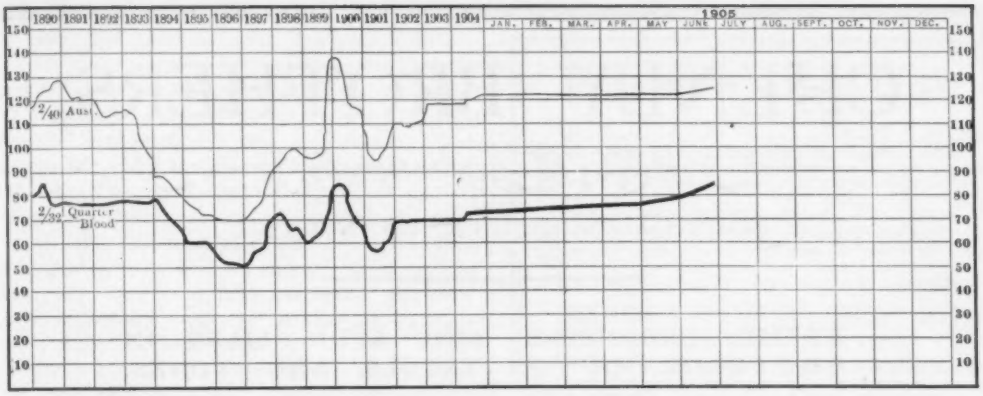


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

will be curtailed very largely through the manipulation of the fabric. Mercerized cloth will be largely used the coming season, and as this cloth is made with the use of 50 per cent. cotton yarn, one thread of worsted twisted with a cotton thread, the use of worsted is curtailed and the cost of the cloth is kept within bounds.

It looks as though all worsted fancies would be but a small factor in the next light weight business. The mercerized cloth besides being cheaper is constructed in such a way that only an expert can detect the difference. The mills making this fabric are greatly encouraged and are looking for some good orders when the season opens, the first to fifteenth of August. The weavers of fancy worsteds who insist that they will make the straight fancy worsted have yarn bought, some of them claim, until December, but from inquiries the chances are that if they secure much business September will be when their needs for yarn will begin. They are very careful about placing orders and unless there are some concessions the buying will be of the hand to mouth order.

Spinners as usual are widely apart as to their ideas of value; on the same yarn a difference of from 5 to 10 cents per pound is noted. The prices asked for yarn means that the price of cloth must be advanced 20 to 25 cents per yard over last year where all worsted is used, and weavers state that the clothiers must forecast the situation one year ahead of the present market. It is argued that cloth sold in the coming light weight season will

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

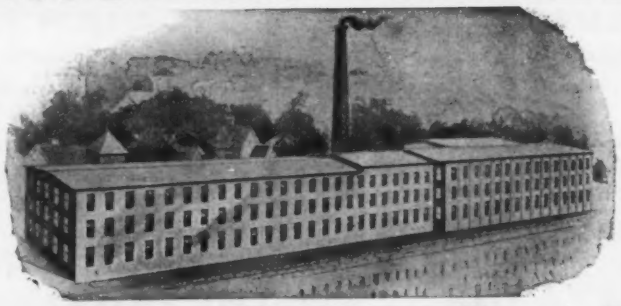
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerised, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 18 to 35s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. **THREADS** on Spools, Tubes, Cones, Unbleached, Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS Latest Styles in Point Laces.

229 Church Street 231 . . PHILADELPHIA

not reach the consumer until one year from the time the cloth is ordered from the weaver and the question is, will the buyer of cloth pay an excessive advance for cloth to go into actual consumption one year from the time of purchase? The chances are under the present condition of affairs that a hand to mouth business will result and although mercerized worsteds will undoubtedly have a great run, all worsted fabrics will move but slowly and it looks as if 1/4 and 3/8 blood worsted yarn, after business is fully developed, will show up poorly, as the mercerized fabrics will be made largely from 1/2 blood yarn.

Knitters generally are getting no benefit from their early yarn purchases. They are giving it to their customers. Many of these mills own yarn 15 to 20 cents per pound under the present market prices. Those who own this yarn are getting all the business, both on Jersey cloth and for the rubber trade and on hosiery. If the whole truth was known, some of the hosiery manufacturers are hardly getting a new dollar for an old one from the fact that while they own worsted yarn at a low value, they own their cotton yarn on a basis of high priced cotton, the relic of the late cotton boom. These knitters state when their contracts at low prices are finished, they intend to buy in small amounts on the market.

Many of the spinners making this low priced yarn are working at a loss. It is in some instances a case of selling yarn at "any old price" in a dull period and not covering for tops and wool. Some spinners have been taught a lesson. We know of one instance where a certain concern was selling tops. They made a price early in the year for October delivery 9 cents per pound under competition. The competitor owned their tops and had them ready for delivery. The concern who made the low price and secured the order owned neither the tops nor the wool to make them, but were trusting to a "divine providence" to hold the market down. Today they stand to lose 25 cents per pound on the deal. This is but one instance of many of the tactics which have been employed during the last few years. It has worked well on a declining market but in the present state of affairs it has proved a losing game and has cost spinners and combers many thousands of dollars.

Much double and twist yarn is being made both in cotton and worsted and in fancy cotton twist. We note also that weavers are beginning to twist heavy counts of worsted with cotton yarn of a relative size. The dress goods weavers continue busy on Panama cloth, but orders for yarn at the extreme high prices are being placed with caution, although in August and September orders for yarn must be placed. We quote:

2/40s Australian	1.22
2/40s Delaine	1.23
2/36s 1/4 to 3/8 Blood	95
2/20s 1/4 Blood	75-82

What's the Use

of buying three or four times as much oil as is actually used for lubrication? For every drop of fluid oil which is **worn out** in reducing friction between bearing surfaces, at least three other drops either never reach the bearing in the first place, or else run through it into the goods and the floors.

The use of **NON-FLUID OILS** means free insurance against mill stains on goods, a substantial decrease in the oil bill, and — last but not least — no increase in the coal bill.

A postal will bring free testing samples by paid express.

NEW YORK & NEW JERSEY LUBRICANT CO.,
17 Church St., New York City.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

FLOSSETTE MILLS
of the
New England Thread Co.
CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS) and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and MERCERIZED YARNS for Knitting.
GLAZING OF YARNS
For the Shoe Lace. TAPE and WEBBING TRADE.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

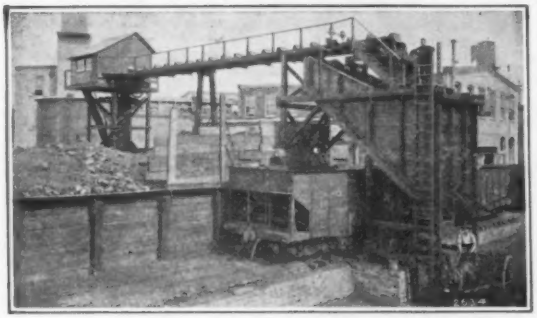
JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

YARNS Solis, Boston.
77
SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH,
Manufacturers of
Diamond Stay Bindings TRADE MARK
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 208 Cheltenham.

Gravity Discharge Conveyor Handling Coal

Plant of THOMAS POTTER, SONS & CO., Philadelphia.



THE BEST FACILITIES for coal handling are the only ones to be considered in a progressive plant. "Best" doesn't necessarily mean the most expensive machinery or the most elaborate, but that whose *actual savings* pay the best interest on the investment. Link-Belt literature and suggestions will explain further. Write to

Link-Belt Engineering Company, Philadelphia.

NEW YORK: 49 Dey Street. PITTSBURGH: Park Building. CHICAGO: Link-Belt Machinery Co.

Woolen Yarn.

The spinners are beginning to slack down. Those mills running on commission are losing business from the weavers of men's wear, as the coming season is to be a worsted season. This will be emphasized still further as the light weight season comes on, as there is naturally a smaller amount of woolen yarn used in the light weights.

Some of the mills making cloth from woolen yarn are running slack. Knitters continue to order and are using much yarn, but are lowering the quality of the stock used and much cotton is required to keep prices down. Spinners find it difficult to get a new dollar for an old one, so bad does the work run. The spinners of sale yarn state that the present is the worst they have experienced in years. The mills using woolen spun yarn are buying in small lots on account of the high wool prices.

Manufacturers state that on high priced fabrics requiring straight woolen yarn they are not looking for orders. If old customers want certain cloth they will make it, but only at an advance. It is thought that buyers will try and get along with the cheaper grades, but that toward the last of the season will be forced to buy the finer grades and pay the prices, but this time the trade must come to the manufacturer as the manufacturer is taking no chances.

To show how this may work we instance the case of knitters making light weight underwear during the proper season. Orders were placed very conservatively, but the first real warm weather has caused a panic among those requiring light weight garments and knitters are flooded with orders for immediate delivery. In one instance the buyer sent a certified check with the order placed for immediate delivery. One knitter showed writer an order for three seasons; the first was for immediate delivery, the second was for heavy weight garments and the third was for the next summer weight season. It shows that buyers are running altogether too close to the wind.

The government has just placed a large order for woolen underwear and the mills securing it will be obliged to run three or four months to fill it. This is the first order of consequence that the government has placed for two or three years. Much

New York, Rifton. The J. W. Dimick Carpet Company has closed the mills owing to differences of the company with employes.

Maine, Kezar Falls. The old woolen mill at this place is being torn down and a new plant with twice the capacity of the old one will be erected.

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes.

Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.

FRANK A. TIERNEY,

Wool, Tops, Noils, Yarns.

Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns

All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.

Room 203, Wool Exchange Building, 260 West Broadway, New York.

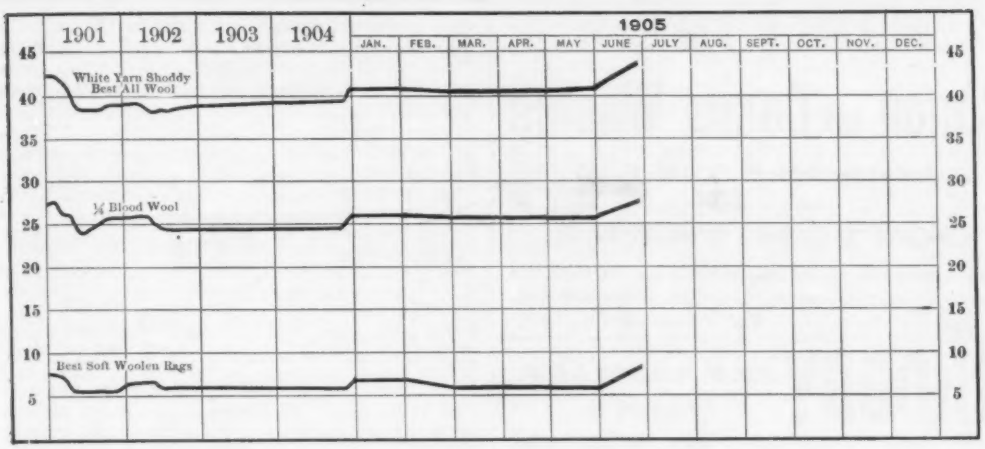


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Australian lambs wool is being purchased, as this class of wool has shown no advance over one year ago. Much Australian thread waste is being imported and everything possible is being done to keep prices within bounds. Australian lambs carbonized are being offered from 77 to 79 cents per pound. Australian thread waste from 65 to 67 cents per pound.

At the present writing it is too early to predict how the season will finally develop and until later a suspension of judgment will be necessary.

Rag and Shoddy Market.

June and July are always quiet months and this year is no exception, although dealers have anticipated rather more inquiry from manufacturers on account of the strength in the wool market. The strength of the rag market has made a corresponding firmness and some advance in shoddy and extracts, which has undoubtedly had the effect of checking sales. It was expected that the high price for wool would lead to large sales for wool substitutes. It is a question whether this has not been found in cotton and cotton yarn rather than in wool shoddy.

Shoddy mills are fairly well employed on old contracts, but new orders are coming in slowly. Cotton waste is very quiet. Home buyers are purchasing much more freely than the export trade, in which there is little or nothing doing. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	44-47
White knit, all wool, best, fine	35-40
White knit, No. 2	30-35
Light yarn, extra fine	25-28
New pure indigo blue	23-25

Merino.

Fine light, all wool, No. 1	26-28
Medium light, all wool, No. 1	18-20
Medium light, all wool, No. 2	16-18
Fine black, all wool	25-27
Fine dark, all wool, best grade	22-25
Medium dark, all wool, No. 1	14-16
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	20-22
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	19-22
Dark blue for hosiery, not all wool, No. 2	14-16

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Fancy colors	16-20
Fine merchant tailors, all colors	8½-9½
Choice light colors	12-13
Browns	12-13
Blacks	8-8½
Fine blues, plain	9-10
Fine dark	9-10
Medium dark	6-7

Worsteds.

Blue	15-16
Black	20-22

Serges.

New black	15-17
New blue	14-16

Flannels.

New scarlet	19-20
New blue	15-16
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	9-10
Old white flannels	20-22
White flannels, No. 2	11-12
Old red flannels	12-13
Light blue flannels	7½-8½
Old blue flannels	6¼-7

WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

SHODDY WM. H. H. SLACK & BRO., Springfield, Vt.

Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Speciality.

New York Office. 140 DUANE STREET. RIVERDALE, NORTHBRIDGE, MASS.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.

Established 1860—Incorporated 1893.

THE S. BLAISDELL, JR., CO.,

COTTON, EGYPTIAN PERUVIAN

American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.

CHICOPEE, MASS.

Cotton Waste Purchased on Yearly Contract from Mills.

A. G. THURSTON & SON,

MANUFACTURERS OF

Fluted Rolls, Pressers for Flyers AND GENERAL MACHINERY

Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened Restepped and Retopped.

Box 528. FALL RIVER, MASS.

Has stood the test of years in Textile Mills

WARREN'S PULLEY COVER.

It allows belts to run slack without slipping. Saves power, belts and bearings. Any careful man can apply it. Is very economical and durable.

Sufficient for 40 sq. ft., $5; 125 sq. ft., $12.

If your supply house does not sell it, order direct.

The Warren Co., Mfrs., 192 Orleans Street, Chicago, Ill.

Fine worsted, new black	20-22
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	20-22
White hood stock	20-22
Clear hoods	9-10
Red stockings	12-13
Blue stockings	8½-9
Fancy stockings, No. 1	9½-11
Gray stockings	9½-10½
Black stockings	10½-11½
Knit stock comforters	7-8
Red knit	12-13
Light gray knit	9-10
New light fancies	14-15
New fancies	11-12

Merinos.

Light, fine	16-17
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse, dark	7-7½
Blue	11-12
Blue—seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	4-5
Bunting	8½-10

FLOCKS.

Shear, fine white, all wool	10-12
Fine indigo blue, all wool	7-8
Fine black, and blue, all wool	6-7
Fine dark, all wool	2½-4
Gig, fine, all wool	2-3
No. 1 black, all wool cut	6-10
All wool, fancy, shear and gig	2-3

COTTON WASTE.

No. 1 Spinners	8¼-8½
No. 1 Machine	6-6½
No. 2 Machine	4½-5¼
Machine Cop	6½-7
No. 1 Cop	7½-7¾
No. 1 Card	8¼-8½
No. 2 Card	7-7¼
No. 1 Oily Card	4¼-4¾
No. 2 Oily Card	3-3½
Peeler Combing	8½-8¾
Egyptian Combing	8½-8¾
No. 1 Linters	4-4½
No. 2 Linters	3½-4
White Clips	6¼-6¾
Colored Clips	5-5½
No. 1 Picker	3½-4½

JOHN P. CRANE CO.,

Manufacturers and Dealers in

Cotton Warps and Yarns on Beams and Jack Spools.

Fast Colors for the Woolen Trade.

Sulphur Black a Specialty. MILLBURY, MASS.

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.60-4.05
Citric, domestic	33-35½
Oxalic	5.00-5.10
Sulphuric, 60 deg., 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	29-29½

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.35-2.40
Alum, lump	1.75-1.80
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	5¾-6
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	21.00-21.25
Copperas	52½-65
Cream tartar, crystals	23½-23¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	25-45
Potash, chlorate, crystals	8¼-8¾
powdered	8⅜-8⅞
carbonate	4-4¾
Soda ash, carbonate, 48 per cent.	1.25-1.50
high test	1.00-1.25
Soda, bicarbonate, English	3.50-6.00
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	60-70
Sulphate, alumina	¾-1¼
Vitriol, blue	5-5.15

Dyestuffs.

Acetate of soda	3¾-4
Acid, picric, best crystals	22-28
tannic, commercial	35-37
Albumen, egg	45-65
blood	21-28
Alizarine, red	15½-16
Aniline oil	10-10¼
salt crystals	8¾-9
Antimony salt, 65 per cent.	13-15
Bichloride of tin, 50 per cent.	9¼-9¾
60 per cent.	12½-12¾
Bichromate of potash, American	8½-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	1-1½
Cutch, mat	4½-6
boxes	5-8
Dextrine, imported	6½-7½
corn	2.35-2½
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	18-20
young root	31.00-35.00
Gambier	4¼-4¾
Hypo. of soda, Am. bbls. cwt.	1.50-1.60
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's, medium to good	47½-60
Gautemala	35-70
Manila	43-45
Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	15.00-19.00
roots	14.00-16.00
Madder, Dutch	7-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	23-25
Persian berries	
Phosphate of soda	1.90-2¼
Prussiate of potash, yellow	13½-13¾
Quercitron, ton	18.00-20.00
Starch, corn, pearl, bbls.	1.80
corn, pearl, bags	1.65
potato	3½-4
rice	6½-7½
wheat	5-6
Stannate of soda	10-20
Sumac, Sicily, No. 1, ton	42.00-47.00
Sicily, No. 2, ton	40.00-42.00
Tapioca flour	2-2¼
Tin crystals	22-23½
Tumeric, Bengal	3¾
Zinc dust	5½-6

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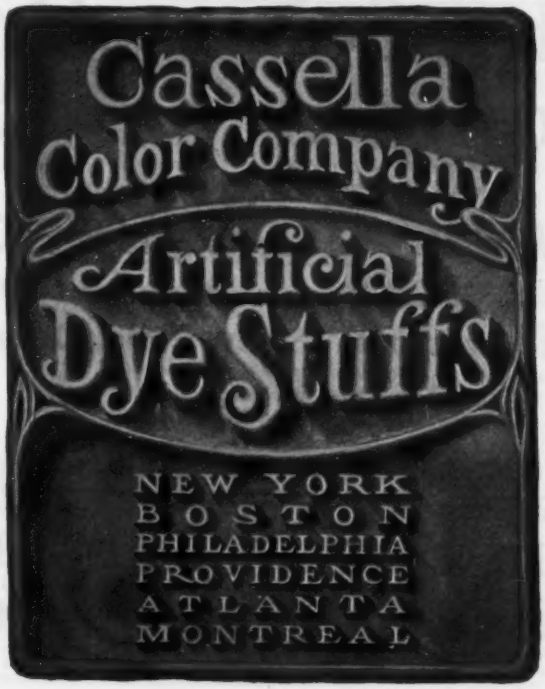
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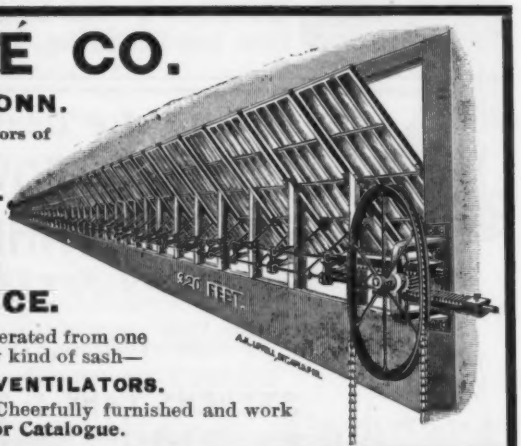

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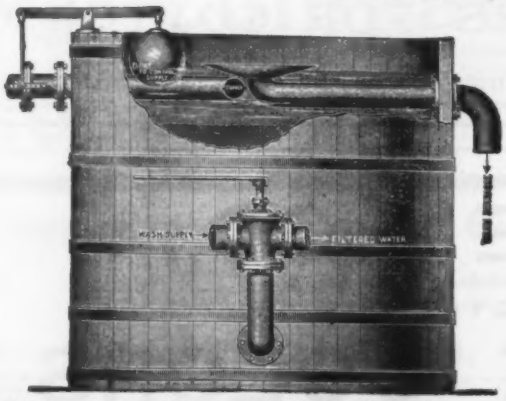

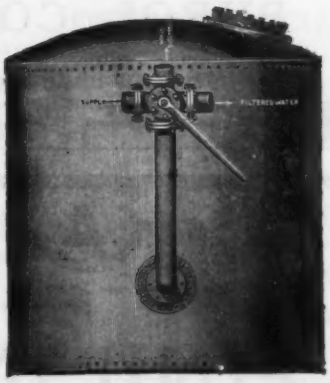

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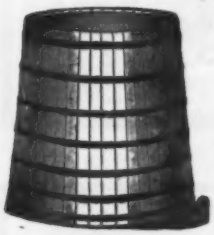

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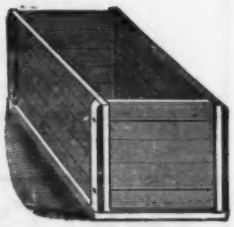

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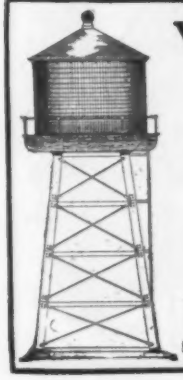

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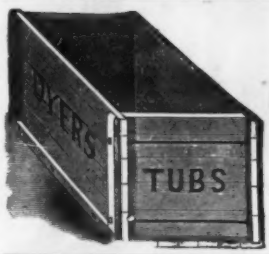

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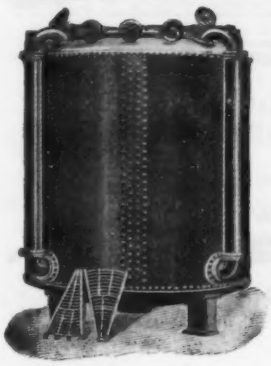

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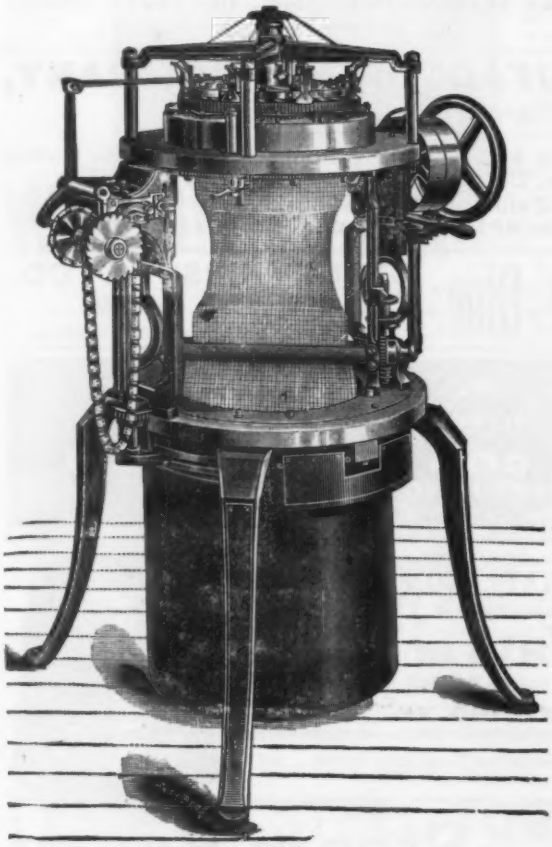

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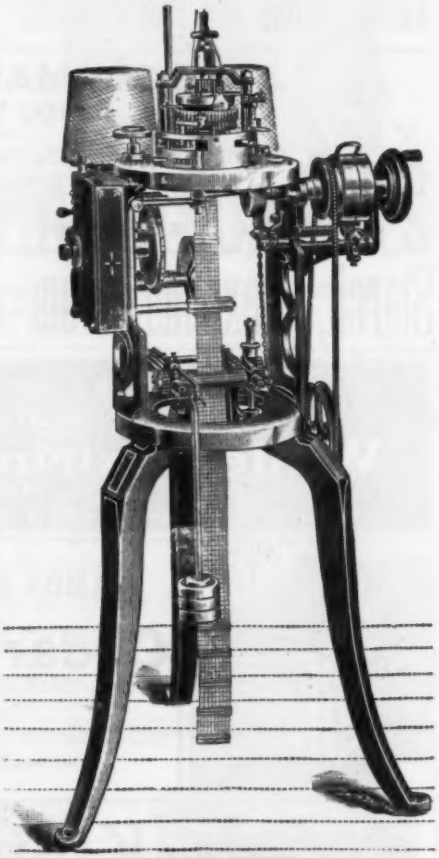

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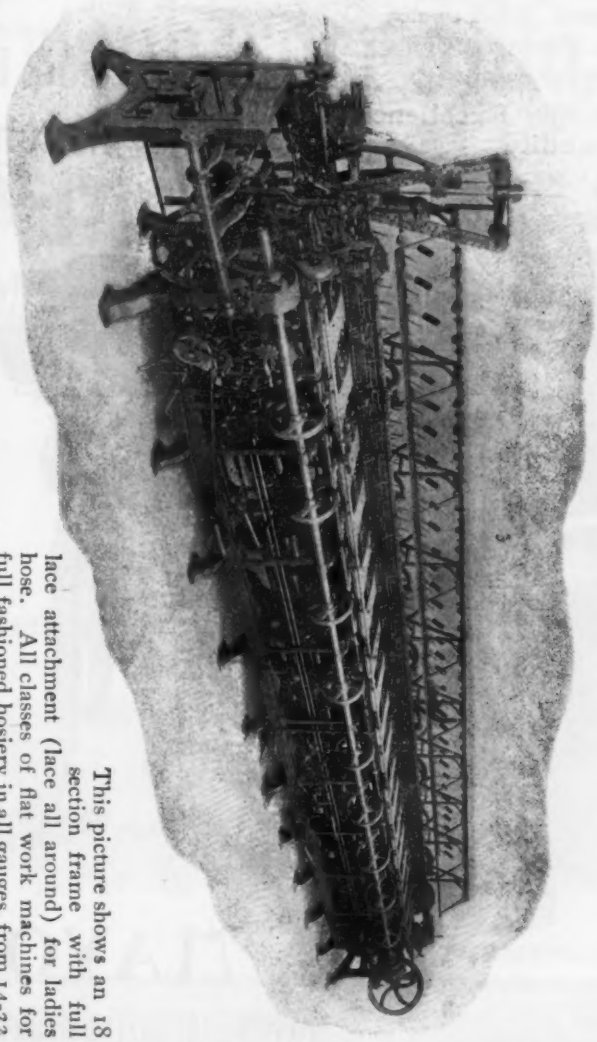

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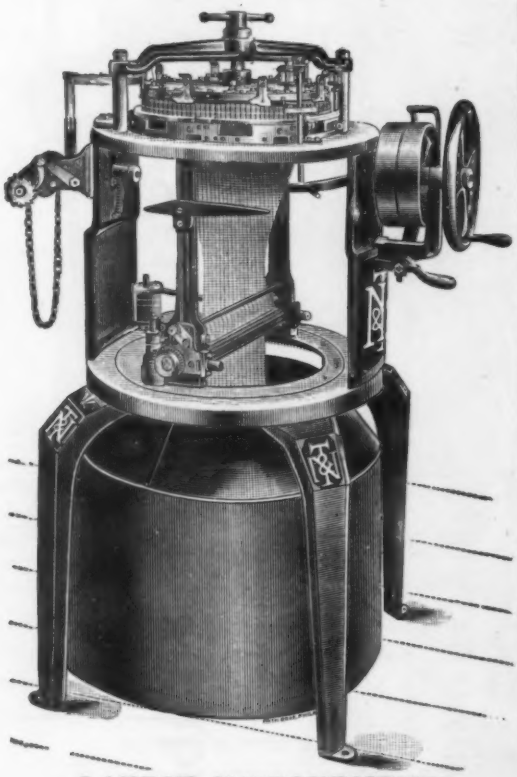

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606 Arch St., PHILADELPHIA, PA.

If You Want

Largest Production For Least Money

Write

Geo. D. Mayo Machine Co.,

Laconia, N. H.

Latest
Simplest
Best

MAYO'S

New Full Automatic Knitter.

PHILADELPHIA OFFICE,
KNICKERBOCKER BLDG., COR. SIXTH AND ARCH STS.,
B. M. DENNEY, REPRESENTATIVE.

Friedberger Mfg. Co.

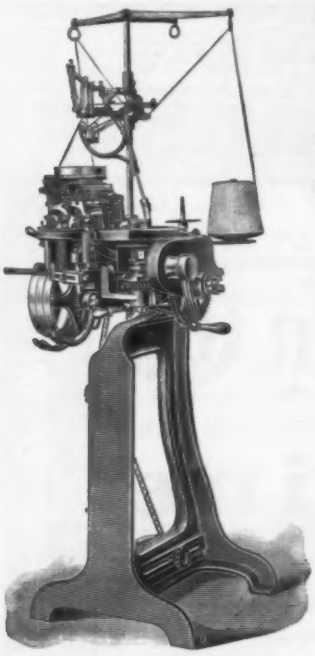
Spring Line 1905 Complete

NOW

Being Shown by Salesmen and at Mills.

GERMANTOWN, PHILADELPHIA

P. O. Address, Logan Station.



Also Furnished for Bench.

The Invincible

"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.

SIMPLE, POSITIVE AND EASY TO OPERATE.

E. JENCKES MFG. CO.

Pawtucket, R. I.

R. M. OATES, Hendersonville, N. C., Southern Representative.

PHILADELPHIA OFFICE, 101 North Sixth St.

The Merrow

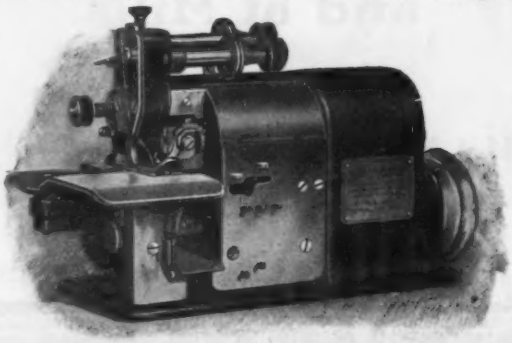
High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

STYLE 35 B SHELL MACHINE

For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



USE STYLE 17 or 22 for Bed Blankets and STYLE 18 for Horse Blankets.

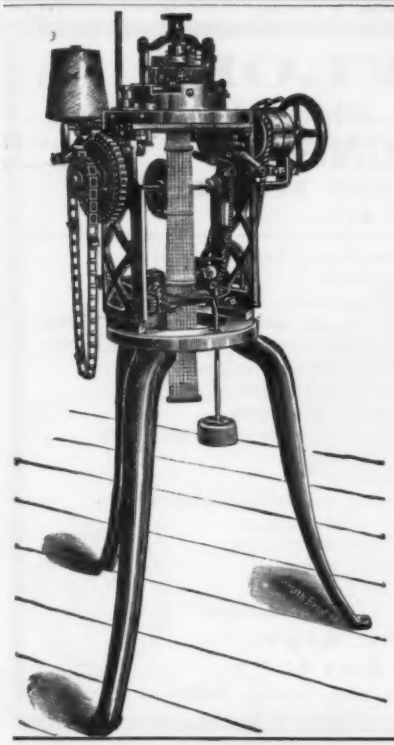
Send for Catalogue and Samples.

THE MERROW MACHINE CO.

Knickerbocker Building, Sixth & Arch Sts., Phila.

HARTFORD, CONN.

346 Broadway, New York



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

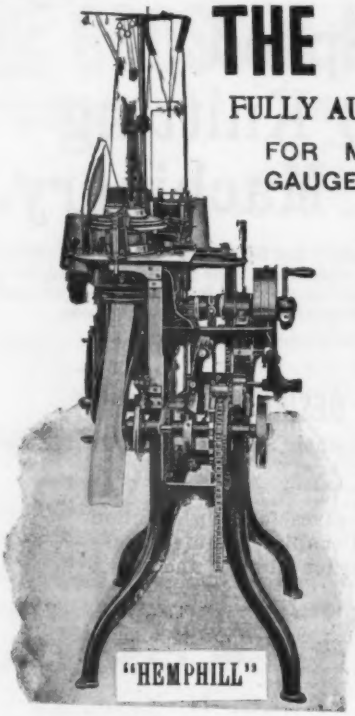
Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

THE TWO LEADERS

FULLY AUTOMATIC HOSIERY KNITTERS

FOR MAKING ALL KINDS AND GAUGES OF SEAMLESS HOSIERY



One with **GEARS**, the other with **CHAIN** for pattern mechanism, to meet the various tastes of different manufacturers.

Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

Write us for further particulars and prices.

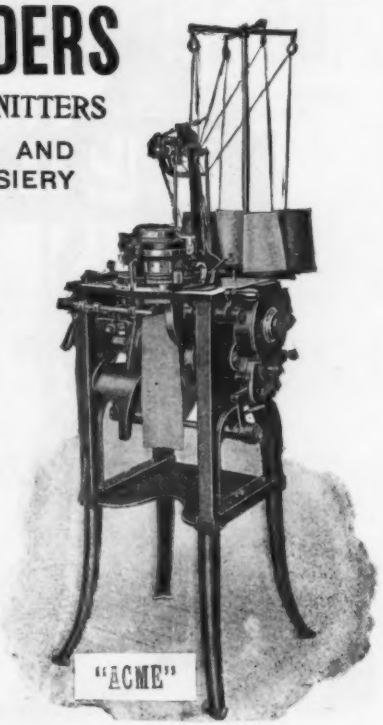
We also make all kinds of **LATCH NEEDLES.** Many leading manufacturers use our needles and say they are the best on the market. Send us a trial order.

MAYO

Knitting - Machine and Needle Co.,

FRANKLIN FALLS, N.H.

Philadelphia Office, Knickerbocker Bldg., Cor. 6th & Arch Sts.



JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

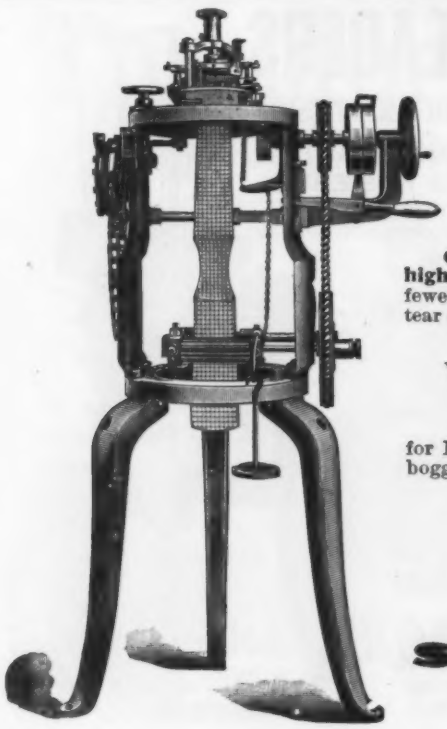
A RARE OPPORTUNITY TO BUY.

20 Payne 48 Spindle Spoolers.
2 Payne 48 Spindle Cop Winders.
50 Scott & Williams ¾ Aut. Knitters.
1 Fireproof Safe.
1 Back Geared Lathe, 6 ft. x 18 in. Swing.
2 Newman's Watchman's Clocks.
1 Westinghouse 25 H.P. Engine.
1 Complete plant; 500 per day of ladies', gents' and misses' hose. Modern mchy.
28 Beattie & Hepworth & Abel loopers.
6 Hosiery presses (lever).
4 Lamb and Grosser sweater machines.
200 Ribbed underwear machines, various sizes.
50 Brinton & Co. ¾ aut. knitters, sizes.
24 Standard B machines.
50 Union Special machines, various styles.
1 Rotary fire pump.
100 Mayo machines. Various sizes.
100 Brooks welters.
4 Fleecing machines. (Nappers.)
98 Brinton & Co. and other make hosiery ribbers.
1 40-Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 10 plate Crawford press, 32 x 43.
2 Lindsay & Hyde winders.
2 Grosser Jacquard machines for gloves.
4 Cyclone dryers
2 Typewriters.
5 Band folding and cutting machines.
5 30-inch ventilating fans.
1 Small Water Motor.
1 Small Steam Pump.
1 Small Belt Pump.
15 Rudolph Seaming Machines.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

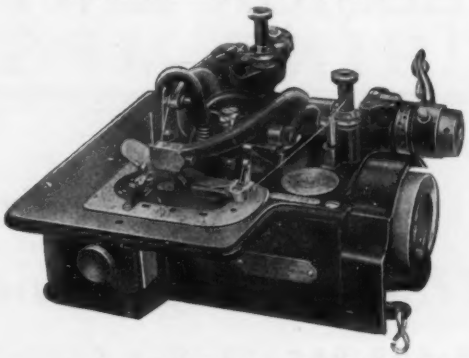
LITTLE FALLS, N. Y.

AN INSTRUMENT OF PRECISION!

"OVERLOCK" MACHINE

(Trade Mark) (Pat. April 5, 1892)

Patent twice upheld by U. S. Court of Appeals



Trade Mark

WILLCOX & GIBBS SEWING MACH. CO. NEW YORK

Business Established in 1859.

For TRIMMING, SEAMING (or Hemming or Overedging) and COVERING Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION** at 3000 Stitches per Minute.

WILLCOX & GIBBS SEWING MACHINE CO.,

General Offices: 658 BROADWAY, cor. BOND STREET,

NEW YORK, N. Y.

LONDON PARIS MILAN DRESDEN

THE GROSSER KNITTING MACHINE CO.

WOOL EXCHANGE Room 400

MAX NYDEGGER

260 W. Broadway NEW YORK

SPECIAL MACHINES
FOR ANY ARTICLE THAT IS KNIT

GROSSER Flat Knitting Machines

For HAND power or fully automatic power machines. Most productive and best machines for sweaters, jacket, blouses, wool hosiery, gloves, mittens, sporting goods in plain, fancy and Jacquard work, Shaker articles, etc. Large stock on hand. Power machines to be seen in operation.

COTTON PATENT HOSIERY MACHINES

Built by H. ALBAN LUDWIG, Chemnitz, for automatic production of full fashioned hosiery, fine half hose, ladies' lace hose, fine underwear; high speed, large production. All gauges and any number of sections from 2 to 24.

FRENCH FRAMES

C. TERROT SOHNE, Cannstadt, Wurt., famous builders of the best circular frame for finest underwear, fleece linings, gloves, etc.

RASHEL MACHINES

For fancy goods in largest variety—Shawls, capes, caps, borders, fringes, lace work, etc., in silk, wool and cotton.

SPOOLERS, Paraffiners, Finishing Machines for the knitting business.

SPECIAL OVERSEAMERS, "Julius Kohler,"

Indispensable for full fashioned articles, sweaters, hosiery, gloves, sporting goods.

Largest Stock in NEEDLES

For Knitting Machines. Best IMPORTED quality. All parts, accessories, etc., delivered immediately from stock.

Samples, Special Offers, Prices, etc., upon application.

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

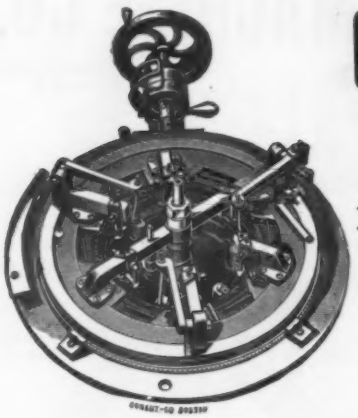
Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

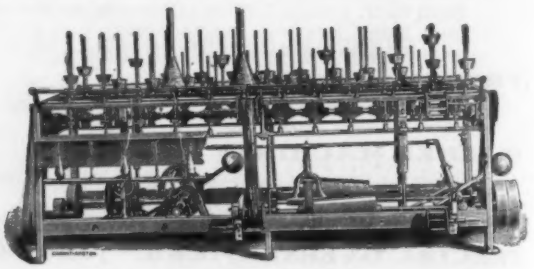


CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

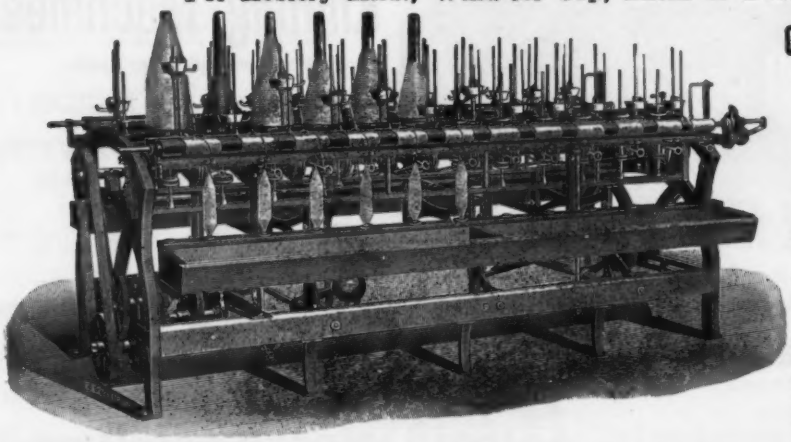
ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET
Pawtucket, R. I.

WILLIAM C. BULL, BENNINGTON, VERMONT.

MAKER OF

For Ladies', Gents', and Children's Goods.

LATEST STYLES.

BEST WORKMANSHIP.

Drying Form Boards

OF EVERY VARIETY.

WORKS: CHEMNITZ, SAXONY Established 1851

G. HILSCHER

FULL-FASHIONED HOSIERY AND UNDERWEAR MACHINE BUILDER

SOLE AGENT FOR UNITED STATES AND CANADA

EDWARD W. KOCH, 319 Bourse Building, Philadelphia, Pa.

"Awarded Gold Medal at World's Fair, Paris, 1900,

for highest improvement in the mechanism of manufacturing full-fashioned hosiery, solidity and perfect workmanship in construction and the superiority of fabric produced."

SPECIALTIES:

COTTON-HILSCHER HIGH SPEED SYSTEM, 65 courses per minute.

COTTON SYSTEM, for horizontal stripes up to 6 Colors, Scotch plaids and vertical stripes, lace through the narrowing, split, etc., etc.

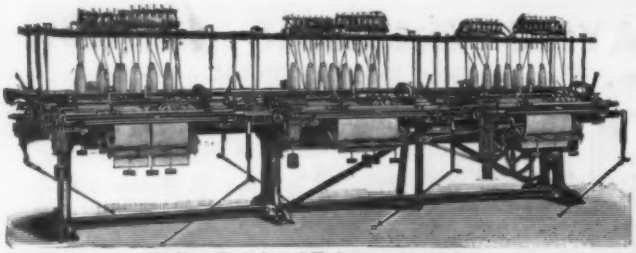
COTTON SYSTEM, wedge heel; this machine manufactures entire full-fashioned ladies' hose or half hose and dispenses with the foot machine.

COTTON SYSTEM, newest construction. The new machine knits the entire hose or half hose complete down to the toe, it makes French heels and French feet.

RIB MACHINES: Cotton system, with and without narrowing.

RIB MACHINES: Hilscher system, high construction.

Machines can be seen in operation at above address.



Cardigan Jackets and Underwear Machine.

AUTOMATIC

Knitting Machines

For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

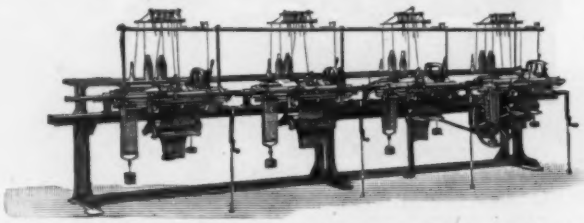
Paris, 1900, Gold Medal.

Ask for samples and particulars, state guage and size you want.

CLAES & FLENTJE,

Mülhausen, Thür, Germany.

Representatives: Ainslie Knitting Machine Co., Ainslie & Humboldt Sts., Brooklyn, N. Y., where all kinds of hand and power machines can be seen working.



Automatic Widening Machine for Sleeves, Drawers, Garments, Plain and Ribbed.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY
} **EFFICIENT, DURABLE, LOW IN PRICE**

CRANE MFG. CO. Lakeport, N. H.

Spring Needle Circular

KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

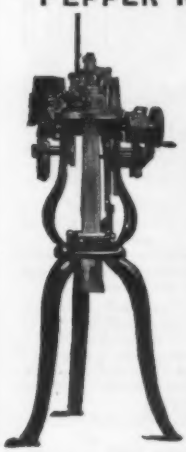
CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

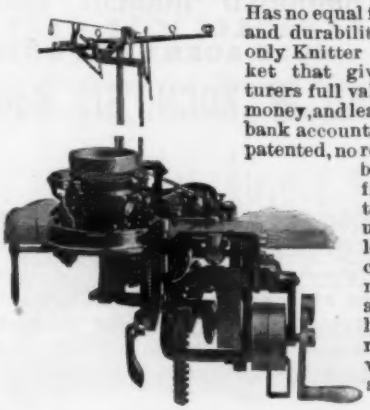
CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

The New Improved

Boss 15/16 Automatic

KNITTER



Has no equal for simplicity and durability. It is the only Knitter on the market that gives manufacturers full value for their money, and leaves a swelled bank account. It is fully patented, no royalty to pay; built in sizes from 2½" up to 6"; from 42 up to 220 needles in 3¾" machine. Knits men's, ladies' and children's hose, plain or ribbed. Runs with one single belt. Automatic tension in heel and toe. Send for prices and particulars to

THE BOSS KNITTING MACHINE WORKS,

Cor. Elm and Reed Sts., Reading, Pa.

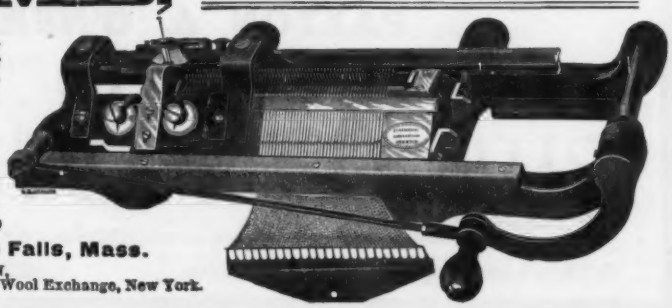
HARDENED STEEL CYLINDERS A SPECIALTY.

The LAMB, LEADER OF KNITTERS.

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 100 23d St., Chicago.

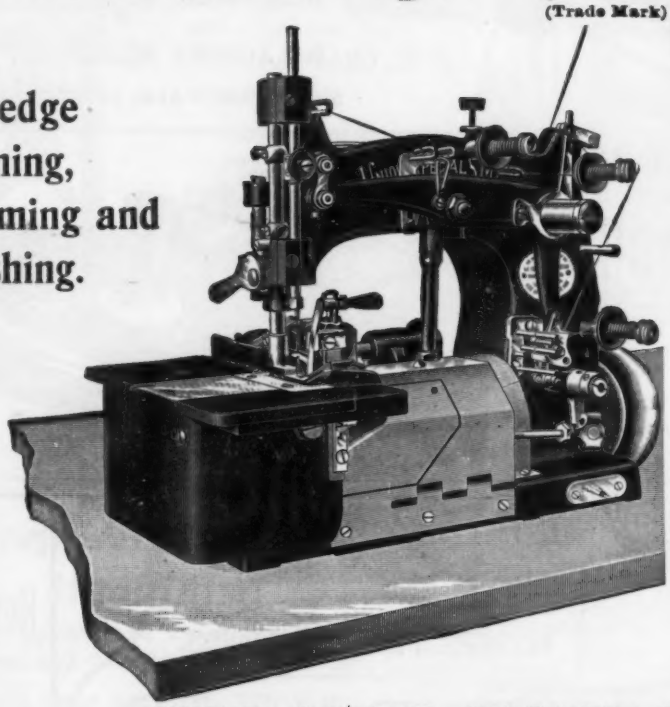
L. D. SANBORN, Room 505 Wool Exchange, New York.

High Speed and Most Durable Mechanism are the Essential Elements of Machines to Produce Sewed Articles. We have these Elements in the

New Union Special Single "Interlock" Machine

(Trade Mark)

For Overedge Seaming, Hemming and Finishing.



High Speed Class 15400.

Two or Three Thread Stitch.

Simplicity.

Durability.

UNION SPECIAL MACHINE CO.

73 E. Kinzie Street, Chicago.
731 Arch Street, Philadelphia.
9 Andrews Street, Rochester, N. Y.
96 South Street, Boston.
1230 Olive Street, St. Louis.
47 Leonard Street, New York.
Amsterdam, N. Y.
Cohoes, N. Y.
714 Main Street, Cincinnati.
578 Mission Street, San Francisco.
2 Gain Street, Montreal, Canada.

PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

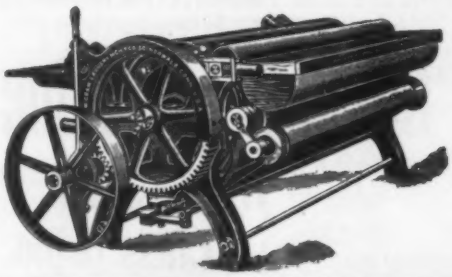
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,
SOUTH NORWALK, CONN.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,
N. W. Cor. Lehigh Ave. and Mascher Street,
PHILADELPHIA.

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

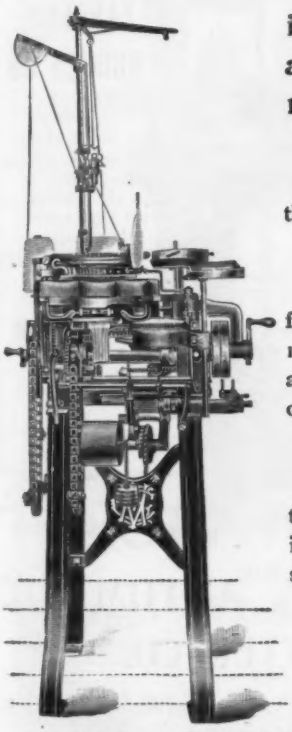
JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

Hosiery Boards.

We Know How

TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



in use than any other make.

Have you seen the new Standard F?

It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

ARE YOU INTERESTED?

STANDARD MACHINE CO.,
508 Ludlow Street,
Philadelphia.

A. McMICHAEL,

Machinist,

Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.

FINE MACHINE WORK.

22 Armat Street, near Main, Germantown,

PHILADELPHIA, PA

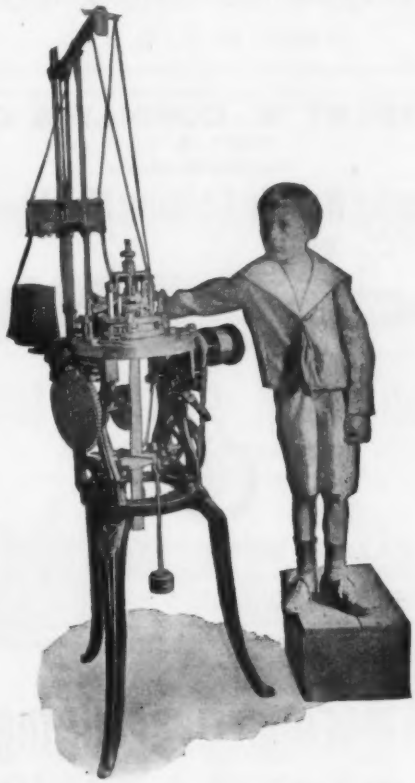
We HARDEN all CYLINDERS and DIALS large and small.

A FAIR PROPOSITION

If wanting to purchase Ribbers, you can try a

RUTH RIBBER and STOP MOTION

before buying to satisfy yourself that they are all right. Our STOP MOTION is a decided improvement over all others. No cutting of yarn, easy to thread. Stops from any imperfection in yarn. The movement of one lever releases brake and corrects yarn guide, when stop is caused by knot you have but one hook to thread. Very positive in its action.



Our RIBBER is high speed, durable, simple and easy to operate, with largest production; single or double feed, plain or fancy stitch for half hose and misses goods. Large loose-course, good round welt, double knee, sleeves or cuffs. Knits wool or cotton yarn, fine or course guage. Hardened cylinders and dials for any make of machine. Best Workmanship. All products guaranteed. Can attach STOP MOTION to any style machine.

Write to-day for price lists.

RUTH MACHINE CO., York, Pa.

Address Box "N." G. W. Ruth, Manager.

Do you wish to make knit goods as perfect as the French or German, and as rapidly as the American?

Do you want to plait?

Do you want to knit worsted or silk?

?

WRITE TO

TOMPKINS BROS. CO.,

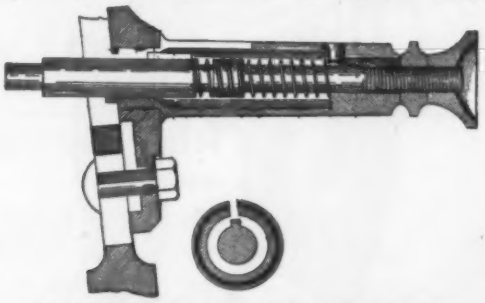
TROY, N. Y., U. S. A.

ROBERT W. CORMLY & CO.

TROY, N. Y.

—BUILDERS OF—

Spring Needle Knitting Machinery

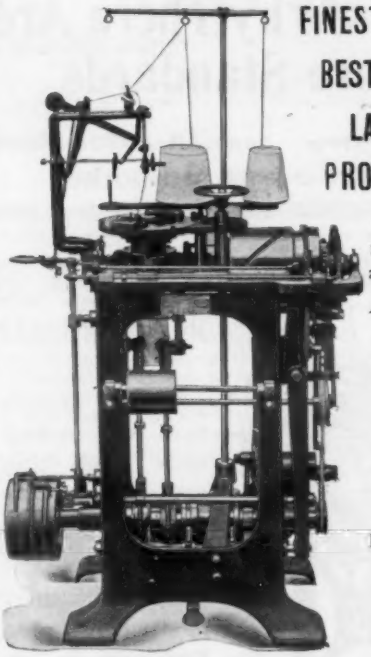


PATENT BURR STAND TUBE

The cheapest and best on the market with more and simpler adjustment than any other make.

"NATIONAL"

Stands for



FINEST GAUGES

BEST FABR C

LARGEST

PRODUCT ON

Greatest Variety of Laces and Novelties.

All automatic.

Lowest Cost for Operating

Also

Rib Knitting Machinery, Overedge, Crochet and Shell Stitch.

NATIONAL AUTOMATIC KNITTER CO.

728 Cherry Street. PHILADELPHIA, PA.

Julius Kayser, Pres. Simon Banner, Treas.

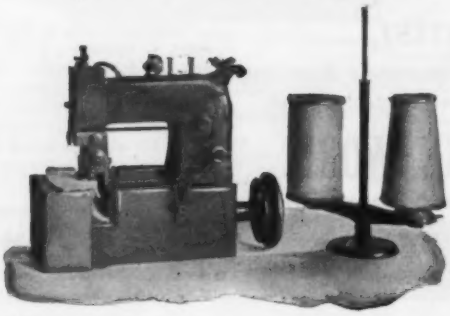
American Overedging and Seaming Machine Co.

Manufacturers of

Overedging

AND

Seaming Machines



For All Kinds of

Cut and Full Fashioned Underwear and Sweaters

FACTORY, 543 EAST 116th STREET - - - - - - - NEW YORK CITY

If You Want

to make three hundred and fifty dollars look like a seat on the Stock Exchange, buy an **Eastman's Electric Cloth Cutting Machine,** and make a comparison.

The former usually means success. The latter never fails, and your investment will prove beneficial to yourself, the retailer and consumer of your production.

THE EASTMAN MACHINE COMPANY

41 and 43 East Eagle St., BUFFALO, N. Y.

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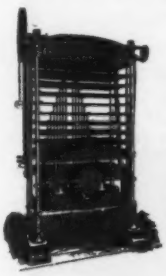

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PLATE PRESS

For Knit or Woolen Goods.

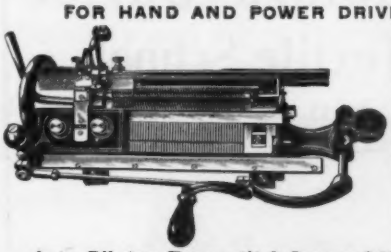
The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,
Successors to
J. J. CRAWFORD & SON,
NASHUA, N. H.
Established 1868.

Best Knitting Machines

IMPROVED CONSTRUCTION
FOR HAND AND POWER DRIVING.



High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. **80,000** Machines sold.

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Mühlhausen, Thür, Germany.

Agents for the East: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N. Y.
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DAVENPORT PEARL BUTTON CO.

Davenport, Iowa.
Manufacturers of
PEARL BUTTONS.
New York Office, - - - - - 377 Broadway

BUTTONS

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Fine Specialties for Fancy Knitting Trade.

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PICKING, CARDING, COMBING AND SPINNING, WARP PREPARATION AND WEAVING, DESIGNING, KNITTING CHEMISTRY AND DYEING.

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Practical instruction in all branches of the

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Oldest in America . . . Most Complete in the World.

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Cotton, Wool, Worsted and Silk

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing.

1905-6.

Day Classes open October 2nd, 1905.
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Special Courses in Textile Chemistry and Dyeing.

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E. W. France, Director, BROAD and PINE STS., PHILADELPHIA.

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SCIENTIFIC and practical training in all processes of textile manufacture, including all commercial fibres. Regular courses three years. Special students received in Mechanical and Electrical Engineering, Chemistry and Dyeing, Decorative Art, and Textile Design, Carding, Spinning, Weaving and Finishing. For free catalog and terms address

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CHARLES COOPER

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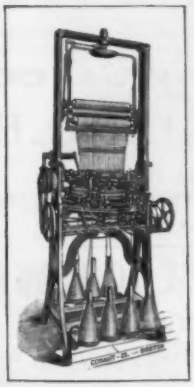
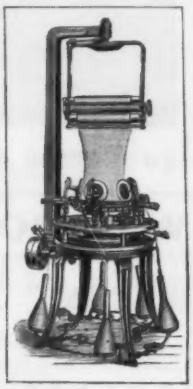


MANUFACTURER OF

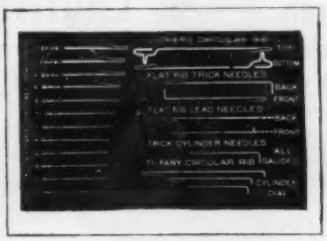
Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

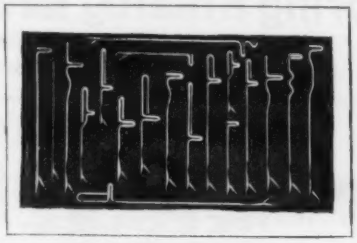


Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.



Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.



COLLARETTE ATTACHMENT.

EUROPEAN REPRESENTATIVES.

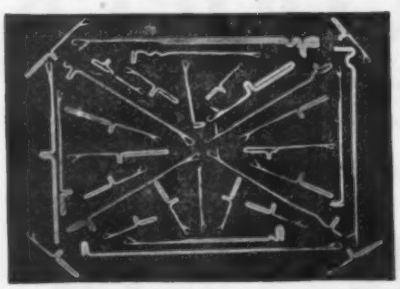
MOSES MELLOR & SONS, Ltd.,
Nottingham, England.

REPRESENTATIVES.

C. J. SIBBALD,
757 River St., Troy, N. Y.
G. H. ROGERS,
509 Clinton St., Hudson, N. Y.

TRY OUR "SUPERIOR" OR SUNKEN RIVET-HEAD NEEDLES

They will save you money.



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WM. COREY CO.,

Manufacturers of Knitting Machine

Latch Needles,

MANCHESTER, N. H.

EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

WM. BREEDON'S SON,

MANUFACTURERS OF

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AND BURR BLADES OF ALL KINDS.

AMSTERDAM, - N. Y.

ORION TREAT,

MANUFACTURER OF

Screw Riveted Balmoral and Double Rib

NEEDLES

(Patented May 6, 1890.)

All Work Guaranteed. MANCHESTER GREEN, CONN.

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Manufacturers of all kinds of

SPRING KNITTING NEEDLES

NEW BRUNSWICK, N. J.

Manufacturers' Supplies Co.

418 ARCH STREET, PHILA.

Needles and Supplies for Knitting Mills.

Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.

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MANUFACTURERS OF

LATCH NEEDLES

of all kinds. Warranted in every respect.

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KNIT FABRICS CUT TO LENGTH.

Our Knit Fabric Cutter

will cut from the roll, knit fabric into any length from 10″ to 40″ at the rate of 100 pieces a minute. The lengths are accurate, the waste is a minimum, the labor unskilled.

We also make a Slitter

for cutting these goods into narrow strips and re-winding same into rolls.

SAMUEL M. LANGSTON,

Manufacturer of Paper Box Machinery. Ninth above Market Sts., Camden, N. J.

CELEBRATED BRAND PYRAMID TRADE MARK **LACINGS**

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,

115 Franklin Street, NEW YORK.

LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

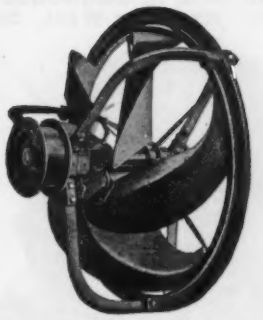
Hepner & Horwitz, 30 Howard St., N. Y.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

THE
"DAVIDSON FAN"
MECHANICAL HEATING
VENTILATING & DRYING
MECHANICAL DRAFT
FANS.
MASSACHUSETTS
FAN COMPANY,
WALTHAM, MASS.



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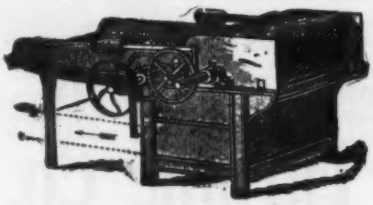
Geo. W. Gerry & Son, ATHOL, MASS.

MANUFACTURERS OF



Lumpers,

Wool and Waste Dusters,
Rag Dusters, Nappers.

Improved Cloth Measuring Machines.

Lumper and Duster Cylinders Refilled and Repaired.

Walter & Co., Limited.

Mühlhausen i/Thür, Germany.

SPECIAL MANUFACTURERS
— OF —

KNITTING AND WINDING MACHINES

for hand and power driving, of best quality and perfect construction.

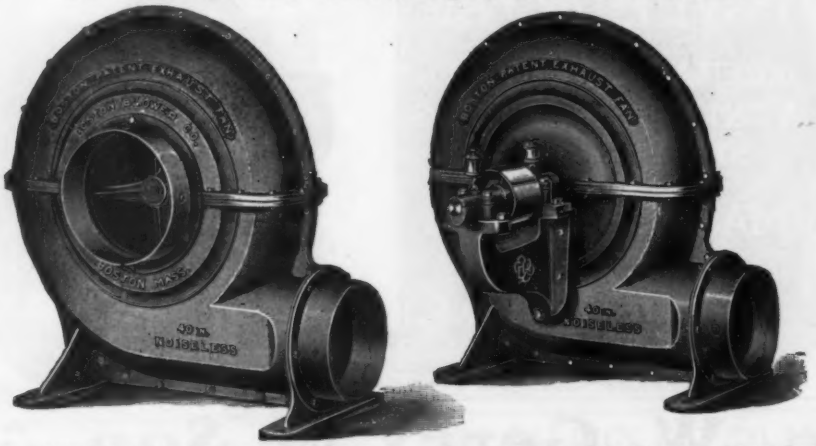
SPECIALTY: JACQUARD MACHINES

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

PRICE LISTS AND SAMPLE ON APPLICATION.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

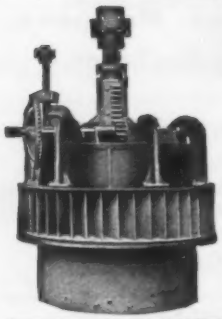


Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



Risdon-Alcott Turbine Co.

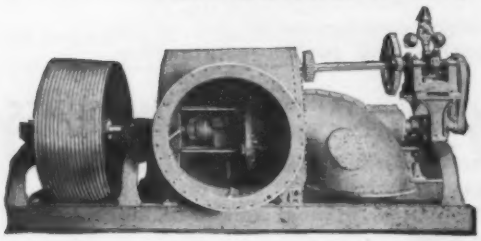
MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE

On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

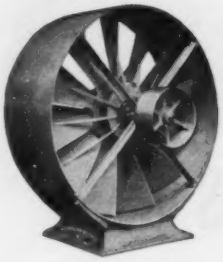
SAMSON TURBINE



HIGH EFFICIENCY means ECONOMY in the use of WATER. This is a very important factor in nine out of ten water power improvements. The SAMSON has a HIGHER per cent of EFFICIENCY when operating from 5-8 to full gate, than any other turbine.

Write Dept. A-5 for Catalogue.

The James Leffel & Co., SPRINGFIELD, OHIO, U. S. A.



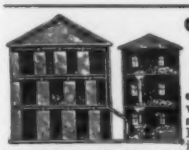
The air is kept pure and temperature comfortable by using

The "ABC" Disc Fans

Strong, Durable, Efficient

American Blower Company

Detroit



CHARLES H. SCHNITZLER,

Patentee and Sole Manufacturer of

THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

SATISFACTION GUARANTEED. Patented Oct. 15, 1889.

315 NORTH SECOND ST., - PHILADELPHIA, PA.

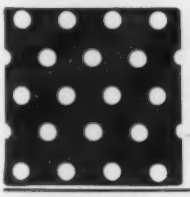
Water Wheel Governors

For TEXTILE MILLS

We Guarantee Satisfaction.

Replogle Governor Works

Write for Catalogue T. AKRON, OHIO.



A. J. BECKLEY

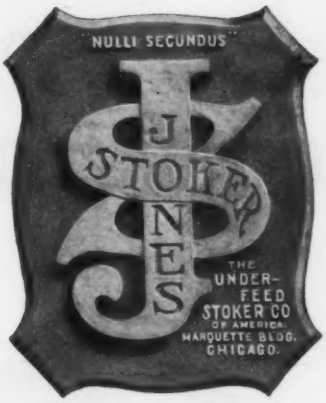
PERFORATED COPPER

For Wool Scouring, Renser Boxes, Dyeing of Raw Cotton. Duster Screens, Picker Screens.

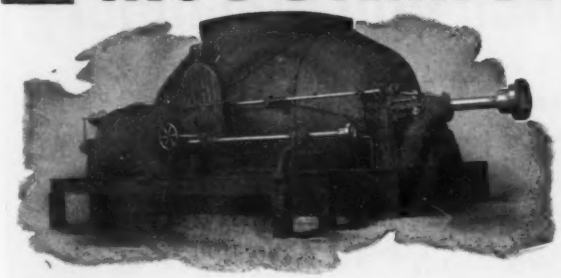
Perforated Screens of all kinds.

Factory and Office:

GARWOOD, NEW JERSEY.



PAIR McCORMICK TURBINES



4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

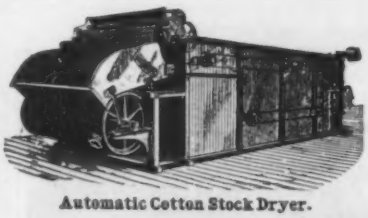
Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.

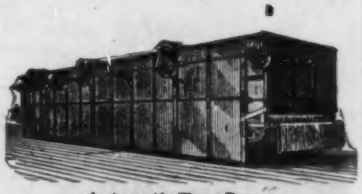
YORK, PA.

Boston Office, 176 Federal Street.

JUL 15 1905



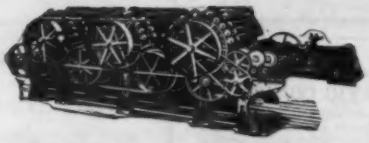
Automatic Cotton Stock Dryer.



Automatic Yarn Dryer.

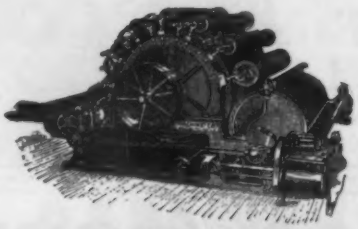
"CYCLONE" DRYERS

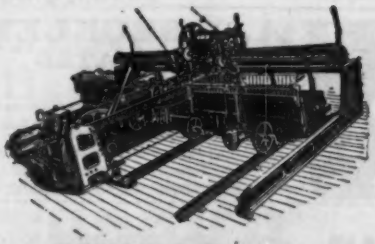
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

Are You on This List?

Herewith is shown the names of different advertisers of textile goods who have used space during the past twelve months in THE BUTTERICK TRIO.

Arnold Print Works
Art Fabric Mills
Avalon Knitwear Co.
Bear Brand Yarns
Belfast Linen Co.
Belding Bros.
Blankenburg & Co., R.
Brown, Durrell & Co.
Burson Knitting Co.
Burton Bros.
Buster Brown Stocking Co.
Calhoun, Robbins & Co.
Castle Braid Co.
Carter Co., Wm.
Chaffee Mfg. Co.
Chatham Mfg. Co.
Chicago-Kanosha Hosiery Co.
Columbia Yarns
Cooper Mfg. Co.
Cooper, Wells & Co.
Corticelli Silk Mills
Courtauld Co., S.
Crane Bros.
Cravanette Co.
Erlanger Blumgart Co., N. (Velutina)
Fay Stocking Co.
Flanola Mfg. Co.
Fleisher, S. B. & B. W.
Frankenberg Co., Henry E.
Gilbert Mfg. Co.
Holeproof Hosiery Co.
Hollins Co., W. B.
Hopewell Mills
Iselin Co., Wm.
Joy, Langdon & Co.
Knitted Padding Co.
Lawrence Dye Works
Leicester & Continental Mills
Linen Thread Co.
Lord & Taylor (Onyx & Merode)
Lorraine Mfg. Co.
Lowell Weaving Co.
Lumb Knitting Co.
Mentor Knitting Mills
Minneapolis Knitting Mills
Moss Rose Mfg. Co.
National Underwear Co.
Nonpariel Velveteen
Norfolk Silk Co.
Northwestern Knitting Co.
Notacot Mills
Novelty Knitting Co.
Paragon Silk Co.
Pelgram & Meyer
Philadelphia Tapestry Mills
Priscilla Undermuslin Co.
Racine Feet Knitting Co.
Read, Wm. F. (Lansdowne)
Richardson Silk Co.
Rochambeau Silk Co.
Rubens & Marble
Skinner Mfg. Co., Wm.
Springfield Knitting Co.
Stewart Silk Co.
Treat, Converse & Co.
Vitality Hosiery Co.
White Mfg. Co.
Whitman & Co., Clarence
Yale Hosiery Co.
York Knitting Mills
York Silk Co.

Some of the above have made more than an ordinary success, but it is safe to assume all of them can testify to the value of the space they used in THE BUTTERICK TRIO. If you are a possible textile advertiser and know any of the above people, it is to your interest to ask them whether or not "Advertising Textiles Pays."

For any specific information or data on any particular line of textile goods and its advertising history, address

RALPH TILTON, Manager of Advertising
Butterick Building, New York City

THE NEW FOSTER WINDER

OPEN WIND from start to finish of cone.
No press-offs from knots, no flattening of yarn.
The only perfect system of winding yarn.
for knitting purposes.

TUBE WINDERS, SKEIN WINDERS, DOUBLERS.

FOSTER MACHINE COMPANY,
WESTFIELD, MASS.

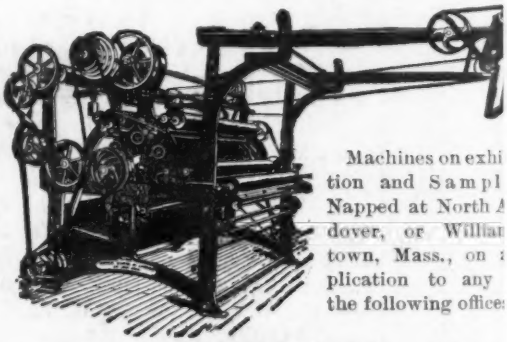
Heating and Ventilating
Drying and Cooling
Mechanical Draft
—BY THE—
BUFFALO FAN SYSTEM

Scientifically and Economically Perfect.
Positive, Controllable, Results Opposed
to Cumbrous and Uncertain Methods.

BUFFALO FORGE CO., Buffalo, N. Y.
Manufactured in Canada by the
CANADIAN BUFFALO FORGE CO., Ltd., Montreal.

THE AMERICAN NAPPING MACHINE Co

Own the principal patents on Napping Machines, representing the latest French, English and American Patents.



Machines on exhi
tion and Sampl
Napped at North A
dover, or Willia
town, Mass., on
plication to any
the following office

Davis & Furber Machine Co.,
Builders and Selling Agents, ... North Andover, Ma
Geo. S. Harwood & Son, 53 State St., Boston.
H. P. HEAP, Treasurer and General Manager
WILLIAMSTOWN, MASS.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:
132 FEDERAL STREET, BOSTON, MASS.
New York Office: Park Row Building.